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EDITORIAL NOTES.

Technical Programme for the Institution Meeting.

FOLLOWING the information given in last week's issue as to the general outlines of the programme for the forthcoming meeting of the Institution of Gas Engineers—to be held at the Institution of Electrical Engineers, from June 14 to 16, with a visit to Nottingham on Friday, the 17th—we are to-day in a position to supply particulars regarding the technical part of the proceedings. Before doing so, however, we should like to note, with considerable satisfaction, the nomination by the Council of Mr. John F. Simmance for Honorary Membership. The work of our old friend in connection with the invention and production of appliances for the testing of gas in respect of composition, quality, illuminating power, and calorific value is known the world over, and he has, by persevering research and industry, won a place in our technical advances of a very distinctive order. We are assured that the nomination will be endorsed with emphasis by gas engineers and chemists; for the work and life of Mr. Simmance has been entirely devoted to the development of those aids to our productive and commercial work which have replaced uncertainty by scientific certainty.

Coming to the technical programme, there is a good variety of topic, and some of it new for an Institution meeting. The introduction to it will be supplied by the Presidential Address of Mr. John Wilkinson, of Nottingham, which, we have no doubt, will make a general survey of the extraordinary happenings to the gas industry and other problems which have engaged its attention while he has been head of its chief technical organization. Succeeding, there will be the report of the Advisory Committee on Education, which will be presented by the Chairman (Mr. F. W. Goodenough). He will probably supply enlightenment upon matters which have been under discussion during the twelve months, with a view to developing the attractions of the scheme for technical educational institutions by taking steps to provide a greater number of students. There are in this connection other matters which have been raised and discussed, such as the position of the isolated student in relation to the scheme. We feel confident, however, that there is one thing Mr. Goodenough will not advocate, and that is relaxing the standard of qualifications under the scheme. The level of training in the gas industry has to be raised, and not lowered, in order to satisfy what we are persuaded are the future needs of the industry in view of developing circumstances. Then come the reports of the Gas Investigation Committee of the Leeds University and the Institution, which should prove particularly interesting. The Seventeenth Report will deal with the examination of the products of combustion from typical gas appliances—on this occasion from gas-fires. The Eighteenth Report will give us the second part of studies in carbonization.

Carbonization and attendant problems will project largely in the proceedings on this occasion. Before the Eighteenth Report is taken in hand, Mr. T. Carmichael, of Portsmouth, will submit a paper on "Modern Carbonizing Economics as Exemplified by Results and Working Costs at the Works of the Portsmouth Gas Company." This should give rise to a valuable discussion. For many years, there has been talk of bulk carbonization in gas-works. The practice has been adopted, but only to a relatively small extent. There can be little question that in our larger works where considerable quantities of coal are dealt with throughout the year, carbonization in ovens will in future take a more prominent place, particularly having in view the tendency to a greater concentration of gas production at central stations for extended supply areas. Mr. G. M. Gill will deal with the question of "Ovens as a Gas-Works Carbonizing Plant." His travels in America have no doubt brought to him a large amount of information in this regard. More is to be heard of the subject of coke at this meeting. The report of the Institution Gas Fellowship on the influence of the ash constituents in the carbonization and gasification of coal will be carried forward to Part III., which deals with gasification of special cokes (*a*) in steam, (*b*) in carbon dioxide, and (*c*) in oxygen. The first section (*a*) is by Mr. J. A. Sutcliffe, B.A. (Oxon), Gas Research Fellow, and Professor John W. Cobb, C.B.E.; the second (*b*), by Mr. W. R. Branson, B.Sc., and Prof. Cobb; and the third (*c*) by Mr. F. J. Dent, B.Sc., and Prof. Cobb. A subject of considerable current importance and interest is that of the "Dry Cooling of Coke;" and, in a contribution to it, Mr. John P. Leather will give some instructive information. The same author, as Chairman of the Refractory Materials Joint Committee, will submit their report for the past year.

Very properly the question of service to gas consumers will be further discussed on this occasion by the relation of "Some Experiences of Gas Service," by Mr. J. Herbert Canning, O.B.E., of Newport, Mon. This is a matter which cannot be allowed to rest. The paper will supply a sort of "follow up" to the Joint Conference arranged by the British Commercial Gas Association and the Institution, which was so highly successful, and, we hope, has since been fruitful by prompting the adoption of the policy of higher service in more gas supply areas.

The material for the educational, technical, and commercial proceedings will, we are sure, be deemed highly instructive, and will claim the close attention of our industry's professional men.

A Lesson from Johannesburg.

THE significant fact that the Municipality of Johannesburg have recently decided to expend £300,000 upon extending the at present, comparatively speaking, diminutive gas service is one of profound importance to those engaged, or financially interested, in the gas industry. We are impressed regarding this by some information which we have been fortunate in obtaining from Mr. W. R. Herring, M.Inst.C.E., who was consulted by the Municipality.

Forty years ago, Johannesburg could not be said to exist, even as a hamlet. It owes its beginning to the discovery of gold on the Witwatersrand in 1886, when it was proclaimed a township, with a population of fifty persons, and with a railway head at Kimberley to the South-West (300 miles) and Valksrust to the South-East (150 miles), from which points all material had to be transported by bullock wagon across velt tracks. In 1888, a Company was formed called the Johannesburg Lighting Company; and they established a gas-works, &c. Most of the plant then put down bears the date of 1889, and is still at work to-day. The first supply of gas to Johannesburg was in 1892. The Johannesburg

Company carried on until 1895, when their undertaking —gas and electricity—was acquired by the local authorities. In 1912, 28 million c.ft. was the annual quantity of gas sold. This had increased to 94 millions in 1926. As far back as 1919, when the sale of gas exceeded 60 million c.ft., the question of extending the gas supply had been considered, and reported upon, by Mr. H. J. Ibbotson; but owing to some delay in obtaining the authorization to raise the necessary capital, the project was not put into practical shape until July of last year.

Before we can fully appreciate the significance of this scheme, it is important to bear in mind certain of the circumstances tabulated in the particulars published in the "Journal" last week (p. 428). Their most striking feature is the small number of gas consumers in relation to the number of houses, and the large number of electrical consumers, which closely approaches the total number of the plots built upon. The next point requiring emphasis is the fact that every house is already supplied with electrical current. Associated with this is the cost of electricity in relation to gas. Gas is 6s. per 1000 c.ft., and electrical current is charged for on a sliding-scale, but otherwise is at a low rate. The next factor to bear in mind is the climate, and first in this respect is the small variation in the duration of daylight throughout the year. Johannesburg is within 3° of the Tropic of Capricorn. The period of daylight is therefore much less variable than in the more Northern regions. In altitude it is situated about 5600 feet above sea-level; and although its geographical situation places it in the tropical regions, its climate is really temperate owing to altitude. It is an extremely sunny climate—its average annual sunshine being nine hours per day. In winter the sunshine averages nine-and-a-half hours a day. In so far as shade temperatures are concerned, it seldom exceeds 90°, and is practically free from humidity—being as low as 3 p.ct. In winter, between sunset and sunrise, the temperature falls considerably. After sunset, both in summer and winter, there is a rapid fall of temperature; and the winter nights are decidedly cold, and artificial heat is necessary. Ground frosts are frequent; the lowest temperature ever registered being 22·8° on June 27, 1921.

From the foregoing it will be appreciated that, even in this favoured place, artificial heat is necessary during a considerable part of the year at the beginning and at the end of each day; and although coal is cheap—the Gas Department filling its needs at less than 10s. per ton —the public none the less demand a gas supply to serve its requirements not only for the short periods when heat is necessary, but for domestic use in the kitchen. To those among us who believe in the teaching that here in England electricity is to serve all such purposes in the future, such a proposition must seem fantastic. To the Johannesburg people, it appears to be a natural development to extend the supply of gas to do what their experience has taught them electricity cannot do; and although the electricity supply is in the same hands—the Municipality supplying both gas and electricity—they are satisfied that an extended gas supply is necessary, and have insisted upon having it.

It appears to Mr. Herring that this tangible example founded upon the experience of an enlightened community such as the Johannesburgers, is a very encouraging sign to all engaged in the gas industry, and to those who have invested their savings in it, borne out as it is by home experience that, notwithstanding electrical competition, the gas industry continues to flourish, having increased its output during the period of keenest electrical development—say, the last 25 years—by no less than 75 p.ct.

Efficiency in Small Works—Meter Registration.

The Presidential Address of Mr. A. T. Kyle, of Abergavenny, to the Wales and Monmouthshire District Institution of Gas Engineers and Managers is a wise and practical composition which we strongly recommend to the consideration of the chief officials not only of small undertakings, but of those in charge of larger ones. The President, being responsible for one of the smaller undertakings, is in a position to view their general conditions from their own platform, and so is able to speak with first-hand knowledge of their difficulties and deficiencies, and the ways to greater successes. We are far from being disposed to lay at the doors of all managers of the smaller undertakings the blame for deficiencies which are so easy to detect in the conditions and operations of some of the latter. There are many among such managers who know what is required, and who recommend and advise, but the administrations are obstructive in respect of the necessary expenditure, through being inappreciative of the value of the economy and efficiency which judicious outlay would ensure. Not only have many of the managers of the smaller undertakings competence, but the conditions of their work demand grit. Last year put this severely to the test; and the gas supply undertakings of Wales and Monmouthshire—not only the large, but most of the small ones—came through the ordeal with colours flying, as did those in other parts of the country.

We are, however, afraid (speaking generally, and not of one particular quarter of the country) that the increased costs of gas production since the war have caused the administrations of not a few of the smaller works to disregard the great essential of maintaining their manufacturing plant and distribution systems in the best condition, in order to bring to bear upon their costs all practicable efficiency, and the saving which can be effected as between plant which has degenerated and plant which is properly maintained and supervised. This condition of neglect will not have been lessened by the happenings of last year, which so considerably affected costs of production and charges to consumers. To last year's experiences, the President devotes the first part of his address. He pays tribute to the loyalty of practically all gas workers during those terribly hard times, which loyalty has emphasized and enhanced the good feeling between gas workers and their employers. They did a large part in assisting their responsible officers in maintaining the gas supply of the country. Mr. Kyle also acknowledges how much the gas industry of South Wales and Monmouthshire is indebted to Mr. Finlay Gibson and his staff for their efforts to keep gas-works going; also to the South Wales Coal Sub-Committee, and particularly the Secretary (Mr. W. Clark Jackson), who spared no pains to get supplies of coal to any gas-works whose stocks were almost exhausted. So well did the Sub-Committee and Mr. Jackson work, that the President declares that the South Wales undertakings can congratulate themselves on having bought imported coal at a much lower price than was paid elsewhere in the kingdom. They were fortunate. Of course, the cost of production was greatly increased. In Abergavenny, the expenditure for coal alone was raised by £1840, which was equivalent to 9½d. per 1000 c.ft. Here we are brought into contact with the question of the relative efficiency of small undertakings as compared with large ones. It cannot be expected—geographical position being similar in respect of distance from the source of supply of the raw material—that the smaller works can produce and sell gas at prices comparable with those charged by large undertakings. Apart from the fact that in the former the condition of the plant generally may not be kept up to the same state of efficiency as on the larger works, and that they have to defer modernization until waning service warrants it and time is opportune, it is obvious that, as Mr. Kyle points out, owing to the enormous quantity of gas made on large works, certain charges are less proportionately per 1000 c.ft. or per therm than on small works. Nevertheless, when we remember all that has taken place in regard to the increased cost of coal, materials, and labour since the war, which have made the total cost of gas sold in Abergavenny increase, comparing 1925-26 with 1910-11, by something like 80 p.ct., it is pleasing to find that, as a result of an investigation of about a score of works in South Wales and Monmouthshire of approximately the same size as Abergavenny, the charges for gas have increased by less than 50 p.ct. This is highly satisfactory, as it shows that new economies and higher efficiencies have been brought to bear, notwithstanding that the works are not in the front rank in respect of magnitude.

We are afraid that with the managers of some of the smaller works it has become an obsession that the aids to higher economies and efficiencies are not for them, but are the privilege solely of the larger works. That is a belief against which men holding different opinions should speak whenever occasion permits. Mr. Kyle takes

the opportunity in his address. In respect of plant, the columns of the "JOURNAL" bear witness that modern equipment has been designed for works of modest output; but such plant will not avail much in the matters of efficient productivity and low fuel account unless it is kept up to the mark by adequate testing and supervision. Some managers of small works are positively scared at the idea of having to make simple chemical or physical tests in order to maintain efficiency; and yet without such tests they have no guide. Others look upon routine testing and the maintenance of best standards within the compass of their plant as almost a hobby. The "rule-of-thumb" or "taken-for-granted" attitude is, the President deliberately says, entirely out of date. He is right in this, as in the assertion that, if a manager of a works, no matter how small the latter, is to maintain an efficient service, he must have all the necessary means to enable him to do so. He properly insists that every works should have a small laboratory with the requisite apparatus to enable the manager (or an assistant) to carry out tests for purity, composition, and quality. There comes the question of expense. The manager who says the undertaking cannot afford the means, shows a deficiency of knowledge. The administration who refuse the manager such aid are themselves inefficient for their office, and are depriving the undertaking of the best levels of operation, which is as bad as throwing money into the gutter. There is far more lost through the absence of tests essential to the maintenance of the standards of working than the total of the costs for establishing the necessary provision, and for carrying out tests day by day. Denied a laboratory, the manager is without the best of aids to efficiency and economy.

Mr. Kyle also deals with unaccounted-for gas, which is a troublesome matter in the mining areas of South Wales and Monmouthshire. Fortunately, Abergavenny does not suffer from mining subsidences; and the President is not satisfied with a leakage of 7·8 p.ct. He is doing his best to reduce it, by searching for points of escape, which are hidden in the distribution system which largely had its birth in the distant past. He has found live service-pipes leading nowhere, but simply stopped with corks; he has found a 3-in. main with a wooden plug in the end. He is wondering what else he will find as opportunity for making investigations presents itself. His experience also convinces him that defective meters are chargeable with much of the unaccounted-for gas. Remarkable are the data regarding the last hundred meters sent away for examination; and they are proof, in the case of his town, of the truth of his contention. Of the hundred, only 23 were correct, 19 were fast, 33 were 5 to 50 p.ct. slow, and 25 passed gas without registering it. An analysis is supplied of the 58 slow ones and those which passed gas without registering; and it is worth studying, setting out as it does the numbers of meters which would not register consumptions under 3 c.ft. per hour up to 192 c.ft. per hour. Mr. Kyle says he gives this detail as the results are "so extraordinary as to be quite startling." We think the term "extraordinary" a correct one. There is no mention in the address of a periodical survey and testing of meters at Abergavenny; but what is done is to compare consumptions with those of corresponding periods, and, if there is any doubt, the meters are taken out, and replaced by others in proper registering condition. This system of weeding out defects may account for the large proportion found slow or which passed gas without registration.

There is no question that money spent on ensuring low leakage and the prevention of meter shortcomings is profitable to small as well as large undertakings. The largest of all gas undertakings has found this. In that wonderfully informative paper which Mr. E. C. Holt, of the Gas Light and Coke Company, recently read before the London and Southern District Junior Gas Association, on the "Necessity for High Capacity Meters," he dealt extensively with the subject of registration. He gave the advice that, in connection with the installation of gas apparatus, the capacity of the meter should be first looked at, and then consideration be given to the maximum load which it would have to bear per minute. A little deep thinking over this matter of loads per minute may surprise many. In the case of the Gas Light Company, it has been found that systematic attention to meters has had a marked effect on the amount of gas unaccounted-for. The percentage (on the corrected basis) has been reduced from 7·2 to 3·85 in the four years ending 1926. It is also shown that, in the case of meters which have proved "slow," the average percentage of error has fallen gradually from 9·75 to 8·82 p.ct. in the seven years ended 1925, and to 8 p.ct. by December, 1926. Meters "passing unregistered gas" have gradually fallen in the same period from an average of 24 c.ft. to 14 c.ft. per meter, and to 13·1 c.ft. by December, 1926. Meters proved to have "stopped registering" have decreased from 21·87 to 8·7 p.ct. in the seven years, and to 7·7 p.ct. by December, 1926. Meters in which "no passage of gas" is proved have also declined from an average of 8·75 to 3·18 p.ct. in seven years; the figure at December, 1926, being 3·27 p.ct. Meters "correct in registration" have increased gradually from 33 to 38·77 p.ct. in the seven years; and in 1926 to 41·16 p.ct. Thus, it will be noted, a general improvement is shown in the Gas Light and Coke Company's area in respect of unaccounted-for gas through defective meter registration. A great deal of information is given in Mr. Holt's paper regarding the care taken in the maintenance of meters in the area of the large Company he serves. The information is of particular interest in conjunction with Mr. Kyle's remarks on the subject.

Throughout the address, the President has one goal, and that is the promotion of higher efficiency in small works. He believes there is scope for much improvement; but to effect it there must be an abandonment of the attitude which sacrifices efficiency for false economy. "This," he says, "should not be; and any reasonable expenditure on the lines I have indicated, with the view of maintaining a full and efficient service of gas, would be money well spent, and would repay itself by a satisfactory service being constantly maintained."

Politic Service—Lady Inspectors.

As Mr. W. Clark Jackson, of Neath, says in a paper which he contributed to the proceedings of the Wales and Monmouthshire Institution of Gas Engineers and Managers, the service side of the gas business is so vital to the industry, particularly in view of the keener electrical competition, that there is good excuse for raising its consideration again and again; for the gas manager in every supply area has to appreciate that to-day it is something more than the price of his commodity which will influence and retain custom. The service rendered by the commodity is equally important as the price in relation to that of coal, electricity, and oil. It must not be forgotten that it is partly due to our own activities that the purveyors of these commodities are increasing theirs. They are as eager to extend their business at our expense, and to prevent gas getting new custom, as we are, by fair means, to take from them, and to prevent their securing, additional business. Electricity especially does not base its own qualifications for acceptance on price only, but on convenience, cleanliness, and other claimed merits, which have little or nothing to do with cost. We have to meet these lines of advocacy, and can only do so by ensuring that gas is giving in every application its most efficient service to the consumer. In other words, we have to maintain the satisfaction of the consumers. The plan which Mr. Clark Jackson gives for business retention is the education of consumers in the efficient use of gas, regular visits of qualified and courteous gas officials to ensure that all is well, and, lastly, the maintenance of a high tone by all connected with the undertaking in dealing with consumers. When in 1920 the problem was tackled in Neath, the adopted lines of procedure were as follows: (1) A maintenance scheme which would work successfully. (2) Showrooms which would be of service to consumers. (3) General standardization of gas burners, mantles, and fittings, as far as practicable. (4) The stocking of only such gas apparatus as had been tested by the staff, and found efficient. (5) Education by publication, gas demonstrations, &c. These lines have proved very effective.

In one respect Mr. Clark Jackson believes that the maintenance scheme he has devised is unique. After having employed male inspectors, he substituted lady inspectors. His experience is that this is a step in the right

direction, as it is found that the lady inspectors can obtain access to consumers' houses at any time of the day, and, generally speaking, they get on much better with the lady of the house. The lady inspectors are thoroughly trained before being sent on to the district. They have a course in the repair shops, in order to learn how to adjust; regulate, and repair all classes of cookers, gas fires, and burners. Then they are sent out with the senior lady inspector; and, on her report that the new junior is satisfactory in every way, she is sent out to work independently. The inspectors deal on an average with 35 consumers per day; and the whole of the district is covered by them in approximately six weeks. For their services no charge is made; the consumer paying only for the actual material replaced or purchased. The cost of the service, after giving credit for profits on sales made by the inspectors, works out to rather less than ¾d. per 1000 c.ft. of gas sold. It would be very interesting if other gas managers, who have trained lady inspectors for maintenance work, would communicate their experiences for the general good. We know that during the war burner maintenance work was very largely carried on by women workers, but their services were dispensed with on the return of the men from the war. So far as recollection goes, for such light work they were very efficient; but we do not think they did much in connection with the maintenance of the heavier appliances. It was also found that, in large cities and extensive buildings, the work was not always of a nature which could be dealt with by women; but we can understand that what is not always practicable in a large town or city may be perfectly feasible in the smaller country towns. Another point is that the author, being in charge of a corporation gas undertaking, has found it necessary to enter into an arrangement with the local plumbers and ironmongers in connection with the establishment of a showroom, which at present is more or less of a temporary order, though useful; and it is to be replaced by larger and more modern premises. What has been done in connection with plumbers and ironmongers is to enter into an agreement under which they can purchase from the showrooms at a special trade discount, which frees them from the need to stock gas apparatus on their own account. This works remarkably well; and it has had the effect of ensuring that only the first-class gas appliances are sold which the undertaking has adopted. This has enabled good progress to be made with the work of standardization, which has an advantage not only in respect of assuring the use of efficient appliances, but in reducing the stock of necessary maintenance parts.

In the last section of the paper, Mr. Clark Jackson shows a wise breadth of view in the matter of the means taken to educate the public in the efficient utilization of gas. The information he gives (upon which we have touched but briefly here) will be useful to managers who, convinced of the wisdom, are now contemplating carrying out this highly essential policy of maintaining gas appliances, and thus the satisfaction of the consumers.

Progress, and an Injustice, in New Zealand.

IN the "JOURNAL" last week, we gave a digest of the proceedings at the meeting of the Gas Institute of New Zealand. With all the difficulties and sequestered state (through distances) of the professional gas men in that quarter of the Empire, the four-year-old Institute is gaining in numerical strength, and is doing excellent work by providing periodically the means for conference and the relation of experiences. As we read the address of the President (Mr. M. J. Kennedy, the General Manager and Secretary of the Wellington Gas Company, Ltd.), and the papers by Mr. W. O. R. Gilling, of Christchurch, Mr. J. W. Blackburn, of Masterton, Mr. W. H. Cattell, of Sydney, and Mr. J. J. Rogers, of Auckland, there is admiration for the fact that, technically and commercially, our colleagues in those far-away parts are abreast of the best practices in this country, and can supply an excellent lesson to not a few gas men at home whose inventive powers are limited to the fabrication of excuses for clinging to old-fashioned ways, while all around them developments are proceeding which, if they do not quickly change and move with the times, will seriously hamper and eventually undermine their concerns. In the President's address, we see how largely continuous vertical retorts, with steaming, have been adopted in New Zealand; and how successful in Wellington he finds waste-heat recovery in connection with that system. In Mr. Rogers' paper, we read how at Auckland they believe in prevention being better than cure, and guard as far as is humanly possible by systematic inspection and maintenance against complaints by consumers. Mr. Rogers' advice is: "Carry out work before the trouble arises, and so win the respect and good feeling of consumers." In order to ensure that the consumers get good results from the gas they purchase, the city has been divided into sections; and each section is placed in charge of a man who visits each house once in three months. Meters are tested, burners are cleaned and adjusted, and any sign of pipes requiring clearing is reported. Through the maintenance staff last year 313 gas cookers were sold. Thus the evidence far away, as at home, is that competent inspection means detection of incipient trouble before the consumer is aware that anything wrong has threatened.

We grumble at home over the weight of our rates and taxes. They are oppressive. But in New Zealand, as is pointed out in the Presidential Address, the incidence of the imposts as between private gas enterprise and municipal concerns and power boards is grossly unjust. The gas sold in Wellington last year amounted to 539 million c.ft. The Company, in the past six years, have paid to the Government no less than £86,554 in land and income-tax, annual licence, and stamps for gas receipts; and to the City Council, £15,066 in rates, royalty on gas used in certain areas, and other annual charges. Together, these sums amount to £101,600, or approximately an average of £17,000 a year. On the basis of a gas sale of 539 million c.ft. a year (and it was not up to that throughout the six years), the charge for these inflictions by the Government and the City averages 7·57d. per 1000 c.ft. All the gas consumers have their own rates and taxes to bear; and it is scandalous that, through their gas supply, they should have to pay so much more than those people who are not consumers of gas. This becomes still more accentuated when it is remembered that the utilization of gas in place of raw coal is a public advantage. The injustice is further heightened when it is found that municipal concerns and power boards are exempt from these heavy charges. It would be much fairer if the proposal made some years ago by a Taxation Committee were put into operation by the Government—that municipal and Government trading concerns should be placed on the same footing in respect of income-tax as private companies. A singular and intolerable weighting of the balance against gas enterprise is also found in respect of Customs duty, to the disadvantage of gas, and the advantage of electricity. The Customs duty charge in respect of gas cookers is 25 p.ct.; electric cookers, 20 p.ct. For gas burners the percentage is 20; for electric lamps, 10. Gas engines are charged 15 p.ct.; electric motors, nothing. Cast-iron pipes have 20 p.ct. placed on them; electric cables are admitted free. What justification is there for this heavy distinction? Manifestly the whole system of taxation and rating requires overhauling, and equity established, so far as is possible in mundane conditions which contain many imperfections and inequalities. But the glaring inconsistencies to which Mr. Kennedy calls attention are capable of being rectified, and should be if the Government of New Zealand are animated by a desire to defend and uphold justice to the fullest extent of their power. The gas industry as a public utility should be assisted, and not hindered, in its work.

Price Reductions.

THE gas undertakings of the country are keeping faith with the consumers, and are reducing the price of gas as rapidly as possible. With the June meter readings many concerns will have got clear of the burden of the cost of coal due to the seven months' coal stoppage, and will put into operation once more the charges for gas which ruled prior to the cessation of coal production at the end of April last year. In most cases there has already been a partial lowering of the temporary addition to the price, and the finish will be given in a few weeks' time. The recent

fulminations superficially against the charges for gas, but actually against conditions which nobody in the industry could help, and which, owing to the care and exertions of the managements of gas undertakings, everybody outside it ought to have thanked goodness were not worse, were largely centred upon the Gas Companies of the Metropolis, through the activities of the type of newspaper which rejoices in creating a public outburst, whether or not justified. It was bound to happen that, sooner or later, newspaper-fomented agitation notwithstanding, the price of gas would fall again—first, because gas stockholders were suffering, due to the sliding-scale, loss of dividend during the reign of the higher prices, and, secondly, because the competitors of gas (coal, electricity, and oil) were having an opportunity of which they were not refusing to take advantage. Now that the "Daily Express" "understands" that the Gas Light and Coke Company are expecting to be in a position to make a reduction (the second since the end of the stoppage) in the price of gas at the end of June, bringing it to the pre-stoppage one of 9·4d. per therm, the Wandsworth Company are at the same time coming down to their old charges, and the South Suburban Company have given notice of 1d. per therm reduction, the fomenters of trouble are foolishly taking to themselves the credit for bringing about the concessions. It is beyond their appreciation that exactly what is happening would have happened without their intervention. Gas companies cannot afford to maintain at any time the price of gas beyond the absolutely essential point. It is not to their trading interests, or to those of their stockholders. At the beginning of February—long before a comparatively few of the consumers grumbled about their gas accounts—Sir David Milne-Watson, in his address to the proprietors of the Gas Light and Coke Company, said: "We are particularly gratified to think that, by the end of March, "we shall be able so to reduce the price that the increase "over the pre-stoppage figure will fall from 23 to 9 p.ct. "only; and I hope that well before the end of the year "we shall be able to get back to a normal price." In much the same language, intimations were made by the Chairmen of most companies, at their last meetings, that the price of gas would recover its old level as quickly as possible. It will thus be seen, by our friends of the Press, that the reductions were contemplated long before people were blaming the gas companies for the rise in their accounts—due partly to the unavoidable increase in price through the British coal miners' long idleness, and partly to the increased use of gas, and not as was alleged, with the refutation standing out boldly in official reports, to a lowering of the calorific value, or to a sudden determination on the part of consumers' meters to function against them and in favour of the Companies. The "Express" states that every consumer in the area of the Gas Light and Coke Company who complained of an excessive gas bill has been visited by a representative of the undertaking; and we rather fancy that not all of them have been willing to have their meters tested at the "L.C.C." meter testing-stations. It would be interesting to know what the "Express" means by "the excessively high charges" made in the accounts for the quarter ended March last. Accounts cannot be "excessive," if there has been the consumption; and the additional price per therm only clears the costs of producing the gas which has been consumed during the period of high prices for coal—particularly foreign coal. We take it the proprietors of the "Express" expect to be paid for every copy of the paper they supply to the public.

Industrial Survey for Promoting Gas Sales.

We have always believed in the closest collaboration between manufacturers of gas appliances and gas suppliers, because of their joint efforts there is confidence that development can be carried much farther than by separate operation. An article in this issue deals with the subject of "An Industrial Survey as an Aid to Increased Gas Sales." There is a tremendous scope for gas in the industrial field if only the work is taken in hand in a systematic manner; and an industrial survey is the most powerful method to the end in view. The manufacturer of gas furnaces desires to sell his products just as much as the gas supplier requires to sell his gas, and to obtain the good day loads which the industrial field offers. As the article elsewhere shows, an industrial survey, properly organized and carried out, has something more in it than the mere obtaining of a list of industrial establishments where heat is required. There are the individual characteristics of the heating operations to be considered; fuel cost in relation to production; the cost of gas as a fuel, not in relation to some other fuel, but to the overall economies which can be derived from a change to labour-saving and easily adjustable gas. The article deals with these points and more. In short, the industrial survey which is offered to gas undertakings is "a plan to assist them to obtain the industrial load, and to supply a proper foundation of information for sales work."

First Order under the 1925 Act.

In the House of Lords on May 10, the Special Orders Committee reported that no petition had been presented against the Farnham Electricity (Extension, &c.) Order. They also stated that a report had been received from the Ministry of Transport upon the Order, pointing out that it is the first since the passing of the Statutory Gas Companies (Electricity Supply Powers) Act, 1925, authorizing a Gas Company incorporated by a Special Act to raise capital for electricity purposes. The Ministry had taken the advice of the Law Officers on the question raised by the Order; but nothing was found in it to which the Committee thought it necessary to call the attention of the House.

Electric Cookers and Housing Schemes.

Further evidence of the disfavour in which electric cookers are held by the tenants of municipal houses comes from Dover, where the weekly revenue is so small that the Electricity Committee are not disposed to extend the number. Further information regarding this is given in the first paragraph in the "Electricity Supply Memoranda." The unlet houses at Liverpool, and the discontent at Eltham and on other estates, should bring housing committees to their senses. Tenants in municipal houses desire a labour-saving means of cooking; but they want the most economical and reliable. Their experience contradicts that of electrical experts, some of whom carefully give continued habitation to gas-cooking in their own households. We do not blame them.

Under the Million Mark.

It gives considerable gratification to find that the total number of persons unemployed, as registered at the labour exchanges during the week ended May 9, fell below the million mark. The actual figure was 998,300. This is within 20,000 of the lowest figure since 1920. On June 3, 1921, there were more than 2½ million men, women, boys, and girls idle, so that the 998,300 is a number which is indicative of, relatively, an excellent return to industrial activity. At the same time, standing alone it may strike the reader as still being a formidable figure. But when analyzed it is found that of the number 241,600 are normally in regular employment, but are temporarily disengaged; and a further 68,200 are persons normally in casual employment. This leaves 688,500 men, women, boys, and girls who are wholly idle; but of these 269,800 are young workers—in fact, many of them are only beginners. This all points to progressive industrial revival.

Separating Hydrocarbons in Coal Gas.—A note by Messrs. F. E. Frey and W. P. Yant, communicated by the United States Bureau of Mines to the "Journal of the Franklin Institute," states that fractional distillation has been found especially useful in determining the composition of coal gas in analytical work of the Bureau of Mines. A method has been developed in the Bureau's laboratories whereby the individual saturated and unsaturated hydrocarbons in coal gas can be accurately determined. It was found that the boiling-point of the different hydrocarbons—methane, ethylene, ethane, propylene, propane, butylene, and butane—mostly depends upon the number of carbon atoms contained in a molecule of the substance, and is affected very little by differences in structure and in saturation. The method involves supplementing the usual Orsat analysis by fractional distillation, and can be applied to very small samples—only 50 to 2000 c.c. of the gas being required.

PERSONAL.

Mr. FRANK GREENHALGH, who has been appointed by the Gas Committee to fill the position of Gas Engineer and Manager to the Oldham Corporation, in succession to Mr. Tim Duxbury, who has retired, entered the service of the Gas Department 22 years ago, and shortly afterwards was transferred to the Engineering Department under Mr. Duxbury. Mr. Greenhalgh has held successively at Oldham the positions of Chief Draughtsman, Works Manager of the Central Works, and, since 1924, Works Manager of the Higginshaw Works.

INSTITUTION OF GAS ENGINEERS.

Programme of the Forthcoming Meeting.

The Annual General Meeting will be held on Tuesday, Wednesday, and Thursday, June 14 to 16, at the Institution of Electrical Engineers, Victoria Embankment, under the Presidency of Mr. John Wilkinson, O.B.E., Engineer and Manager to the Nottingham Corporation Gas Department.

Tuesday Morning, June 14, 10 a.m.

Minutes of the last Annual General Meeting to be submitted for confirmation.
Appointment of Scrutineers for examination of Balloting Lists for election of Officers and Council for the year 1927-28.
Presentation of the H. E. Jones "London" Gold Medal to Mr. C. H. Rutter, M.Inst.C.E., for his Paper on "The Development and Reconstruction of the Portslade (Brighton) Gas-Works" read in 1926.
Presentation of Diplomas awarded in 1927 under the Institution's Education Scheme.
Nomination of the respective Presidents of the American, Belgian, Canadian, French, German, Italian, Norwegian, Swedish, and Swiss Gas Associations, for election as Honorary Members of the Institution.
Nomination of Mr. John F. Simmance, M.I.Mech.E., for election as Honorary Member.
(1) Presidential Address.
(2) Annual Report of the Council for year 1926-27, and accounts for year ended Dec. 31, 1926.
(3) Report of the Advisory Committee on Education, to be presented by the Chairman, Mr. F. W. Goodenough, C.B.E.
Discussion of the Report.
(4) Seventeenth Report of the Gas Investigation Committee. Examination of Products of Combustion from Typical Gas Appliances. Part II.—"Gas Fires."
Discussion of the Report.

Adjournment at 1 p.m.

Tuesday Afternoon, 3.15 p.m.

(5) Paper on "Modern Carbonizing Economics as exemplified by Results and Working Costs at the Works of the Portsmouth Gas Company," by Mr. Thos. Carmichael, of Portsmouth.
Discussion of the Paper.
(6) Eighteenth Report of the Gas Investigation Committee—Studies in Carbonization—Part II.
Discussion of the Report.

Tuesday Evening, 8 p.m.

Reception and Dance by invitation of the President and Mrs. Wilkinson at the Connaught Rooms, Great Queen Street. Invitations are being issued to those who have made application for them. It is requested that replies be sent to the Secretary *not later than June 7.*

Wednesday Morning, June 15, 10 a.m.

ANNUAL GENERAL MEETING OF THE BENEVOLENT FUND.

AGENDA.

Minutes of the last Annual Meeting to be submitted for confirmation.
Annual Report of the Committee of Management for the year 1926-27, and Accounts for the year ended Dec. 31, 1926.
Other business.

Institution Meeting (*continued*), **10.15 a.m.**

Scrutineers' Report of, and introduction of, newly elected Members, Associate Members, and Associates.
(7) Paper on "Ovens as a Gas-Works Carbonizing Plant," by Mr. G. M. Gill, of London.
Discussion of the Paper.
(8) Report of the Institution Gas Fellowship on "Influence of the Ash Constituents in the Carbonization and Gasification of Coal."
Part III.—Gasification of Special Cokes:
(*a*) *In Steam*, by J. A. Sutcliffe, B.A.Oxon. (Gas Research Fellow), and J. W. Cobb, C.B.E., B.Sc., F.I.C. (Livesey Professor).
(*b*) *In Carbon Dioxide*, by W. R. Branson, B.Sc., and J. W. Cobb.
(*c*) *In Oxygen*, by F. J. Dent, B.Sc., and J. W. Cobb.
Discussion of the Report.

Adjournment at 1 p.m.

Wednesday Afternoon, 3.15 p.m.

(9) Paper on "The Dry Cooling of Coke," by Mr. John P. Leather, of Letchworth.
Discussion of the Paper.
(10) Report of the Refractory Materials Joint Committee, to be presented by the Chairman, Mr. John P. Leather.
Discussion of the Report.

Thursday Morning, June 16, 10 a.m.

(12) Paper on "Some Experiences of Gas Service," by Mr. J. Herbert Canning, O.B.E., of Newport, Mon.
Discussion of the Paper.
Scrutineers' Report of the Election of Officers and Council.
Presentation of Presidential Certificate.
Place of meeting next year.
Votes of thanks.

Friday, June 17.

Visit to Nottingham.

Selective Reply Forms are being issued to those who have *intimated* their intention of joining in this Visit. *It is requested that replies be sent to the Secretary* NOT LATER THAN June 7.
Those travelling to London *via Nottingham* from places north of Nottingham will be allowed to use their return tickets for the visit to Nottingham, breaking their journey home. Those with special day London to Nottingham return tickets, obtainable from the Secretary, will require to return on the same day.

a.m.
8.15. Meet at St. Pancras for Special restaurant car train leaving at 8.30 a.m. (Breakfast and light refreshments will be available on the down journey to Nottingham, and dinner on the return journey to London.)
10.53. Arrive Nottingham. Divide into parties (motor coaches will be provided) for visiting either:
1. The Basford Gas-Works.
2. Messrs. J. B. Lewis & Sons' Hosiery Works. (Party limited to 50.)
3. The Raleigh Motor and Cycle Works.
4. Messrs. Boot's Drug Company's Laboratory and Works (party limited to 80); 40 to visit the Chemical Factories and Laboratories; 40 (ladies) to visit the Perfumery and Toilet Manufactory Departments.
5. The Castle (Art Museum) and Grounds.

p.m.
1.0. Luncheon at the Drill Hall, Derby Road, by invitation of the Corporation of the City of Nottingham.
2.30. Motor Coaches leave the Drill Hall for Welbeck Abbey, the Nottinghamshire residence of the Duke and Duchess of Portland. Visit by permission of His Grace the Duke of Portland.
5.0. Tea in the Riding School at Welbeck.
5.30. Motor Coaches leave Welbeck Abbey for Elmton and Cresswell.
6.0. Special restaurant car train leaves Elmton and Cresswell Station.
6.50. Arrive Nottingham.
6.55. Depart from Nottingham.
9.36. Arrive St. Pancras.

Advance copies of the Papers and Reports can be obtained, when ready, on application to the Secretary.

THE BURKHEISER WET PURIFICATION PROCESS.

Considerable attention was attracted, shortly before the war, to the method proposed by Burkheiser for the recovery of the ammonia and sulphur from coal gas by combining them as ammonium sulphite. Interest was revived a short while ago by an article in our contemporary, "Das Gas- und Wasserfach," of which we gave an abstract translation in our issue for Dec. 15, 1926, p. 709. In this it was pointed out that the process, though answering all requirements when tested on a laboratory scale, had failed in certain respects in the one instance in which it had been adopted under practical working conditions. It was claimed, however, that the introduction of certain modifications had now eliminated the former difficulties.

In view of this claim, especial interest attaches to a recent investigation of the theory of the process by the eminent chemists, Terres and Hahn, carried out at the Brunswick University, a full account of which was given in "Das Gas- und Wasserfach" for April 2 and the three succeeding numbers. They point out that the process is based upon a principle which, in one form or another, has been suggested at various times in the past seventy years. Its attempted introduction into practice has always met with failure, but, in view of the advance which its successful application would imply, especially in the bye-product coking industry, the authors set themselves to investigate thoroughly the physical and chemical basis upon which the process depends.

The lines upon which the experiments were conducted, and the results, are set out in considerable detail; and the conclusion arrived at is that purification by the process suggested is decidedly a practicable proposition, and, if the correct conditions as regards concentration and temperature are maintained, it should be capable of practical application without any great difficulty. They characterize the early attempts as the failure of an intrinsically sound idea through lack of a thorough grasp of the underlying chemical and physico-chemical principles.

North of England Gas Managers' Association (Auxiliary Section).—The fifteenth half-yearly meeting will be held at the Gas Office, Granger Street, Newcastle-on-Tyne, at 2 p.m. on Saturday, June 11, when the chair will be taken by Mr. C. G. Barrett, the Assistant Engineer and Manager to the Hartlepool Gas and Water Company. Two papers will be read—one by Mr. C. C. Markham (Chief Draughtsman to the Newcastle and Gateshead Gas Company) on "Reinforced Concrete Construction;" the other by Mr. L. N. Weldon (Commercial Assistant to the Hartlepool Gas and Water Company) on "Gas Sales Development in a Medium-Sized Undertaking."

ELECTRICITY SUPPLY MEMORANDA.

Non-Paying Electric Cookers at Dover.

RESIDENTS on the Eltham housing estate, and estates in other quarters, have been aggrieved because they are not allowed to have gas cookers under the autocratic ruling of their local representatives, who tyrannically take upon themselves the rôle of governors, and compel the use of electric cookers. The Liverpool Corporation have a large number of all-electric houses for which they would like to find tenants; but there is no rush for these dwellings. Now the Dover Electricity Committee find that an average revenue of 9d. per week from electric cookers on their housing estate is not exactly a paying proposition. According to the Electrical Engineer, several people have inquired about electric cookers on the estate. Cookers, however, are installed in 42 of the houses; and he frankly confesses that the revenue from them does not warrant further expenditure in this direction. Apparently the people do not use them when they have got them. The Dover experience is not a short-period one. Since last July, with the coal stoppage, winter, Christmas, and all the inducements thrown in to utilize the cookers, the revenue per week has averaged 9d.—the maximum being 1s. 7d., and the minimum 3d. The current is charged at 2d. per unit through prepayment meters; the capital expenditure per house—including cooker, meter, &c.—being £12. A revenue of not less than £4 a year (after allowing for maintenance and repairs) is required to make this business a paying one. Small wonder the Committee passed a resolution to the effect that no further action be taken in the matter. During the discussion, it was stated that there was not gas on the estate, as the Gas Company would not put in the mains unless the Housing Committee paid something towards the cost. The position is this: The Corporation refuse to allow the Gas Company to instal fittings for lighting purposes. As the houses in question are some considerable distance from the existing gas-mains, the Company could not (in justice to the general body of consumers) undertake to lay the necessary mains free. However, outside the Corporation housing estate, the Company can point to 4818 gas cookers in active service. Leaving Dover for another part of the country, we know of an electrical engineer in whose house a gas cooker, and not an electric cooker, is employed. He would be prepared to use the latter if those whom he serves would give the current free; but he dare not contemplate what his wife would say to removing from the house the range of utility and reliability which her gas-cooker gives her. Meanwhile, outside his home he advocates electric cookers. Occasionally he meditates over the degree of punishment merited by his official advocacy of something he will not (for reasons which his position compels him to hide) adopt in his home life. Necessity, he wrongly argues with himself, knows no law—not even the law of truth.

Consulting and Other Engineers.

There can be little doubt that consulting electrical engineers will find their work considerably diminished, so far as generating station design is concerned, by the preparation of centralizing schemes by the Electricity Commissioners, and their endorsement by the Central Electricity Board, aided by their own technical staff. The change from the independent consulting engineer to the central official engineer will come about progressively. Month by month now it is seen that schemes for the extension of local generating plants are being knocked on the head by the Commissioners, where, in their opinion (which is now dominated by centralization), it is proper for the undertakers to obtain a supply in bulk. It is only the time between present conditions and centralized production which consulting engineers will be called upon to fill in respect of generating stations. Combining with this the removal from the local engineer of the management of such stations (excepting the "selected" ones), and leaving them only the work of distribution and the development of sales, the electrical engineering profession will not in future look so attractive as it has in the past.

Making a Case for Bulk Supply.

Some local authorities believe they have a real grievance against the decisions of the Electricity Commissioners, who appear to be adopting a method of making schemes for extending local electricity undertakings look less attractive than taking a supply in bulk by cutting down the repayment period for generating plant by one-half. If that is true, it is not fair. Comparison should be wholly on normal conditions. The matter has been raised in the House of Commons on a question by Mr. T. Williams in respect of Mexborough. The District Council sought a loan for an urgently needed extension of the generating station. Sanction was refused, on the ground that the Commissioners were not satisfied the Council could give a supply in the district at a cost not greater than that at which a bulk supply could be obtained from the Yorkshire Electric Power Company. Mr. Williams alleged that the Commissioners in doing this (and it is not the only case) based their calculations upon a repayment period of ten years, instead of the usual period of twenty years, for such loans—a change brought about apparently to aid centralization—and that if the period had not been halved, the saving would have been in favour of local generation. The Minister of Transport practically admitted this was correct by stating that the practice of the Commissioners had been to allow a period of less than twenty years for the repayment of generating plant loans where there was reason to anticipate that the plant might be superseded owing to the probability of a bulk supply. In plain words, it is considered expedient to make out a worse case for local generation by imposing an abnormal capital charge burden upon it, in order to make the case for bulk supply look better. It is really too funny for words.

A Couple of "Ifs."

When the House of Commons recently went into Committee of Supply on a vote for the Ministry of Transport, Lieut.-Col. Ashley (Minister of Transport) gave some information concerning the expenditure of the Department in connection with electricity. Last year £19,000 was spent on a special survey in connection with the Electricity Supply Act; and £17,000 was asked for last year for the Severn Barrage investigation. For the latter purpose, this year £12,000 will be required. An amount of £30,000 will this year be paid into the Exchequer by the Central Electricity Board. Into the last two or three years' estimates, Col. Ashley has put a sum for preparatory work for the general scheme of electrification, so that the Board will not be held up in their work for want of funds. The Board have got to work; and "if" the expectations formed when the Act was passed in regard to a great saving in generation costs is achieved (what about transmission?), then it will indeed be a very helpful measure to the trade and commerce of the country. Progress, he also said, is being made with the investigation into the Severn Barrage scheme. "If" we can, by harnessing the tides, find a cheap and abundant supply of electricity for the industrial regions of South Wales, and for cities like Bristol, then we shall have done much to reduce the price of electric power. The investigation can only go slowly; but the scheme, Col. Ashley says, has reached a stage in which considerable hopes are raised that it will be a success.

Variable Lighting Value.

It is an old complaint in the electricity supply industry that different makes of the same type of electric lamp, although reputed to be of like wattage, give variable illuminating results. We have also known parcels of the same lamps from one maker show a distinct difference in efficiency under the same photometrical testing conditions. The point has been raised again in a letter to "The Electrician" by "A. L. W." The object of his communication is to advise those responsible for the lighting of large factories to apply photometric tests to the lamps they use, on the ground that the cost of the service and maintenance of the electric lighting of a large factory is a considerable item in plant expenditure. It is, of course, one of the functions of the electrical engineer concerned to keep this cost at the minimum; and it is obvious that "A. L. W." has good confidence that this cannot be done without knowledge of the actual lighting value of the lamps used. Seeing that the modern electric lamp is the result of large research and years of practical experience, he submits that it might be reasonably thought that between the products of different established firms there would be little to choose. He is afraid that this view has very general acceptance; and therefore little trouble is taken regarding the brand of lamp that is bought. This procedure at one time applied in the case of "A. L. W.;" but not long ago he had occasion to test a number of different makes of lamps, though he started the work with the feeling that both the time and money spent would be so much waste. The results altered his opinion. He found there were three excellent makes, and many others of indifferent quality, in respect of lighting and life efficiency. It was one of the indifferent lamps on which there had been previous standardization for the factory in question. Needless to say, this has been changed; and it is estimated that a large sum of money per annum will be saved. Therefore he suggests that all users should make tests; and this would serve a double purpose. First, the selection of one of the best makes would save money; and, secondly, manufacturers would be given the incentive to improve their wares. Regarding this suggestion, the comment may be made that not all users of electric lamps are in a position to make photometric tests. It is all very well in the case of large factories with a great number of lighting points. But what of the many thousands of householders and shopkeepers who use lights in relatively small number, and who frequently are lured by price, of which they know little or nothing?

Mishaps.

The "Newcastle Chronicle" for April 30 stated that a fire broke out the previous evening in a kitchen over a drapery shop in Frederick Street, South Shields. The flooring and a beam were found to be alight. Fusing of electric wires is "supposed" to have been the cause. London papers for May 17 reported that a fire occurred the evening before in a drapery establishment at Walm Lane, outside Willesden Green Station, "due to the fusing of the electric wires." In a few minutes the whole of the shop front was alight. The summer stock of garments was destroyed; and the family had to escape from the premises by the back entrance. A West of England paper on May 9 reported that a man named Power, employed at the Bridgend Electricity Works, was watching another workman repairing a switch when his arm came in contact with a live circuit (voltage 440), and he was electrocuted. An inquest was held on May 9 on Thomas Owen Thomas, a crane driver at the Margam Iron and Steel Works, Port Talbot. He was electrocuted on the previous Saturday morning. It appears that the crane was standing under some live wires, beneath which was a telephone wire. Before the crane could pass, the telephone wire had to be lifted over the funnel of the crane. Thomas got on to the cab for this purpose. All that was heard was a groan, and the man was seen to be lying on the top of the cab. The jury returned a verdict of "Accidental death," but gave expression to the view that the live wires should be protected or raised.

RESOLUTION OF COAL BY MEANS OF SOLVENTS.

By Charles Cockram and R. V. Wheeler

[Abstracted from the Journal of the Chemical Society for April.]

The authors review the constitution of coal in the light of (chiefly their own) modern research, which enables them to express the analysis of a coal in a form which indicates its properties more clearly than does either a proximate or an ultimate analysis. Thus for Hamstead coal they give the following:

—	P.Ct. by Weight.		
	Ulmin Compounds.	Organized Plant Entities.	Hydrocarbons and Resins.
Vitrain	96	*Nil*	4
Clarain	92	5	3
Durain	83	15	2
Fusain	20	80	*Nil*

In these analyses, certain resin-like compounds, which cannot be definitely classed as resin, present in the coals in small quantity, have been ignored.

Bituminous coals presumably contain the remains of oils, fats, and waxes of the original coal-forming plants, in addition to resins and their degradation products; and these, while forming only a small fraction of the coal, are important by reason of the properties they confer on the coal. These "resinous" constituents or gamma compounds are soluble in both pyridine and chloroform, and are clearly a mixture of several classes of compounds.

The present research deals with these gamma compounds, which were subjected to further fractionation by light petroleum, ethyl ether, and acetone in the order given. As the respective fractions from the large number of bituminous coals tested have the same characteristics, details are only given of gamma compounds from Parkgate clarain. This yielded 6·9 p.ct. of γ-compounds which were resolved further as under:

—	P.Ct. of Coal.	Ultimate Analysis, P.Ct.			
		C.	H.	S.	O + N.
Soluble in light petroleum (1)	2·30	83·90	9·00	0·74	6·36
,, ,, ethyl ether (2)	2·54	82·72	6·9c	0·9r	9·47
,, ,, acetone (3)	0·83	79·00	5·70	0·89	14·41
Insoluble in acetone (4)	1·23	80·00	5·90	1·10	13·00

(1) was a white crystalline substance mixed with a certain amount of red oil, which, in a vacuum, dried to a reddish-brown material of the consistency of vaseline, but which was mobile above 80° C. It consists of saturated hydrocarbons 40; unsaturated 40; resins 20 p.ct.

The residue was a brown powder, which on extraction with ethyl ether, and evaporation of the solvent, gave a brick-red powder melting at 100°-110° C. This fraction consists mainly of resins and resin-degradation products.

The residue, still a dark brown powder (m.p. 280°-300° C.) was next extracted with acetone, which dissolved 40 p.ct. The soluble and insoluble portions are very similar, and are considered to be nearly akin to the resins, representing perhaps the degradation products of some intermediate stage in the production of resins in the plant metabolism such as gives rise to, for example, the tannins.

Illingworth held that a certain proportion of γ-compounds in a coal was essential if a good commercial coke was to be made from it; and while this may be true in general, it has to be realized that a measure of the quality of the coke that can be obtained from a coal is not given by its content of γ-compounds. Coking tests were made on blends of the coal residues, left after extraction, with each one in turn of the γ-fractions from the same coal, in the proportions in which they originally existed; care being taken to avoid oxidation. The results however were not very definite. It is, however, pointed out that, with regard to the composition of the coal, success does not rest solely on the use of a coal containing a sufficiency of some "coking principle." In so far as the presence of a "coking principle" is necessary, the conclusion can be drawn that the agglutinating medium during coke formation consists of the resins and hydrocarbons contained in the coal, or is yielded by those resins and hydrocarbons during the early stages of heating in the coke oven.

The researches of Fischer, Broche, and Strauch on the extraction of bituminous coal with benzene (50 atmos. and 288° C.) are discussed in some detail. These authors indicate an important relationship between the character of the substances extractable by benzene under pressure and that of the coal treated, inasmuch as they suggest that with increasing geological age of the coals the ratio of free hydrocarbons to resins increases, while the decomposition temperatures of the resins are raised. Repeating these experiments, but at slightly different temperatures—viz., 200° and 285° C.—the present authors find that the higher temperature of extraction appears to have caused decomposition of part of the resins, with the result that the proportions of hydrocarbons and resin-like material insoluble in ether have been increased. Some other part of the coal substance also seems to have been decomposed. They also affirm that, with all British coals tested, appreciable decomposition takes place; hydrocarbons being produced at the expense of resins. Apart from this disadvantage, pressure-benzene extraction is not regarded as satisfactory, as it does not appear to be equally effective with all British bituminous coals.

The correlation of the coking power of a coal with its content of that portion of the pressure-benzene extract (at about 285°) insoluble in light petroleum and ethyl alcohol, as suggested by Bone, Pearson, and Quarendon, is difficult to reconcile with the fact proved in this research, that this particular fraction (in the coals examined) consists of two classes of compounds—resins soluble in ethyl ether, and compounds, allied to the resins, insoluble in that solvent. It is therefore of doubtful value to attach importance to the apparent relationship between the coking power of a coal and its content of such indefinite constituents (or, in part, products of thermal decomposition).

FORTHCOMING ENGAGEMENTS.

May 26.—Midland Association of Gas Engineers and Managers.—Spring meeting at Dudley.

May 26.—Society of British Gas Industries.—Annual general meeting and dinner, at the Hotel Cecil.

May 26.—Southern Association of Gas Engineers and Managers (Eastern District).—Meeting at 28, Grosvenor Gardens, S.W. 1, at 2.30.

June 11.—North of England Gas Managers' Association (Auxiliary Section).—Fifteenth half-yearly meeting in Newcastle at 2 o'clock.

June 11.—London and Southern District Junior Gas Association.—Visit to the Margate Works of the Isle of Thanet Gas Light and Coke Company.

July 12.—National Gas Council.—Annual meeting at the Hotel Cecil, at 3.15.

Sept. 23.—Southern Association of Gas Engineers and Managers.—Visit to the Torquay Works of the Torquay and Paignton Gas Company.

Institution of Gas Engineers.

June 13.—Council meeting.

June 14-17.—Annual General Meeting in London.

AN INDUSTRIAL SURVEY AS AN AID TO INCREASED GAS SALES.

By P. HOPKINSON.

It is generally acknowledged that the future of the gas industry is largely dependent upon the greater development of the sale of gas for industrial purposes. Originally the function of a gas undertaking was to supply gas for domestic purposes; but this is changing. In the past the aim of gas-supply officials has been primarily to consider the needs of the domestic consumer, and only in a secondary manner to give some attention to supplying the needs of the industrial concerns.

If gas undertakings are to become dominant factors in the field of industrial fuels, they must alter the operating characteristics of their business, so that they can serve the manufacturer with the same effectiveness and efficiency as has been done in the past with domestic consumers.

The first principle is that the gas undertaking should give a heating service to industry, and should, therefore, advise industry how it can secure the heat it uses most economically.

The second principle is that heating service can be only supplied by the gas undertaking which has complete data on the utilization of fuel as a detail of production processes, and can discuss with industrial management that utilization in terms of the cost of the finished product.

The industrial survey now being offered by one of the leading firms of furnace manufacturers, as a service to gas undertakings, is the connecting link between the industrial consumer and the gas supplier. While this industrial survey plan has been more or less standard practice with certain gas undertakings for some time, the scope has been broadened to include not only a list of likely consumers, but a detailed survey of heat utilization. The main purpose of the industrial survey is to determine rather why gas should be used, than where it might be used.

The industrial survey, which is carried out by one of the furnace manufacturer's experts, for the gas undertaking, usually proceeds as follows:

(1) A general survey is made of the heating operations carried out in the district in question, to determine those industries in which fuel is required in a refined state. The industries are considered first which offer the greatest opportunities for the introduction of gas, although a complete survey of every industry is desirable.

(2) Having drawn up a definite programme as to the industries, a complete survey is made of all the heating operations, and all possible information obtained which has a bearing on the use of fuel, and the fuel costs of production.

(3) The information so gathered is then considered by the furnace engineers to determine what economies could be secured by better fuel utilization and combustion methods. These economies may be the result of one factor or a combination of many, such as change in fuel, more efficient combustion, reduction in labour, reduction in spoilage, improved quality of product, increased output, &c.

(4) A report is prepared for the gas undertaking, showing what increase in output can be obtained with existing gas prices, and also at what price gas would require to be available in order to compete with other fuels.

(5) A report is presented to the industrial concerns where the survey has been carried out, making recommendations as to what economies can be effected, and, where necessary, including quotations for the necessary appliances.

It will be realized that the carrying out of these industrial surveys demands an organization on the part of the furnace manufacturer consisting of an engineering staff capable of analyzing heating operations, and studying the details of the processes in use. A certain amount of research work is also necessary on the part of the furnace maker.

The industrial survey is a plan to assist gas undertakings to obtain an industrial load, and to supply a proper foundation of information for sales work. Generally speaking, no industrial concern is interested in gas or gas furnaces, except as a means to an end; and therefore the only thing the furnace manufacturer or gas undertaking can sell, collectively or individually, is the product of their products. In view of this, the problem resolves itself into a study of combustion requirements in terms of the customer's product. The industrial survey contains many advantages, all based on getting industry to use gas as a fuel, and lays the foundation for the intelligent execution of that purpose.

The gas industry should adopt a definite, well thought out, well-organized sales plan for gas in the industrial world, with close co-operation with furnace manufacturers, who are prepared to carry out industrial surveys, which give the gas undertakings the engineering information upon which sales work can be undertaken in an intelligent and effective manner.

The adoption of the industrial survey is the only basis upon which a sound and successful programme for the sale of industrial gas can be developed.

SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS.

A COMPREHENSIVE VISIT.

Showrooms, Works, and Training Shops.

On Friday last, May 20, the members of the Association were entertained by the Gas Light and Coke Company. Glorious weather favoured the meeting, which commenced at 10 o'clock by inspection of the Horseferry Road Showrooms of the Company. As an illustrated description of these headquarters premises was published in the "JOURNAL" for March 31, 1926, p. 802, we will not describe them in any detail. In designing these showrooms the Company have studied most carefully the comfort of consumers, as is exemplified by the fact that a private telephone box for consumers' use adjoins the reception lounge. The lay-out of the showrooms is admirable. One room is devoted to fires, another to cookers, another to hot water apparatus, and so on; and the smaller fittings are neatly placed in corner cupboards. There is an hotel kitchen; and a white-tiled boiler room contains a gas-heated boiler which serves for the heating of the showrooms and at the same time constitutes an excellent demonstration unit of the convenience, efficiency, and cleanliness of gas for steam raising. A series of model rooms—comprising a dining room, a library, a hall, a kitchen, and a bathroom—shows how well gas can be applied to domestic lighting, heating, cooking, and water heating. Needless to say, it is impossible for every gas company to have showrooms as elaborate as those at Horseferry Road; nor, indeed, is it desirable. But the general effect of a showroom is not dependent on size; and many features of general application were noted during the tour of the premises. One of the points which attracted attention was that all piping to fires is out of sight. The effective sectionalization of gas appliances, too, came in for favourable comment.

THE NINE ELMS WORKS.

Following the inspection of the showrooms, the visitors were conveyed to the Nine Elms Works of the Company, where particular interest centred on two remarkably fine installations —two benches of Glover-West 40 in. retorts, completed this year, and remodelled Humphreys & Glasgow water gas plant. More as to these later.

A handsome brochure descriptive of the Nine Elms Station had been prepared by the Company; and in this it is mentioned that the present works were erected by the London Gas Light Company in 1858—a Company which commenced operations on a site near Vauxhall Bridge in 1833. In 1883 the Company amalgamated with the Gas Light and Coke Company; and at that time the capacity of the station was 6 million c.ft. per day. The present area of the Nine Elms site is 20 acres, of which 17 are used for gas-works. It is bounded on the south side by the Southern Railway; and the northern portion of the works adjoins the River Thames. The present maximum capacity of the works is 21¼ million c.ft. (16 millions of coal gas and 5¼ millions of carburetted water gas).

COAL HANDLING AND STORAGE.

Coal is brought from the North by three of the Company's colliers, each of a capacity of 1200 tons. These are berthed in an open dock constructed at right angles to the river; the turning of the ships being effected by a concrete dolphin in the river. Above the dock is a gantry on which are three hydraulic cranes; and it is from the receiving hopper on the gantry that the coal is delivered to the various retort houses by a system of six belt conveyors, 30 in. wide, running at 460 ft. per minute, and having a capacity of 200 tons an hour. The belts deliver the coal through a central crushing station to the retort house conveyors and overhead storage hoppers.

Part of the coal is stored on ground adjoining the unloading plant at riverside, and the rest beneath gantries at the end of the inclined retort house.

COAL GAS PLANT.

There are four retort houses; and the carbonizing units comprise three different systems—horizontal, inclined, and vertical.

Two similar houses contain horizontals. Each consists of eighteen beds of ten horizontal retorts. Charging and discharging is by Fiddes-Aldridge machines; and in one of the houses there is also a De Brouwer charger. The combined capacity of these houses is 3 million c.ft. per diem.

The inclines are used only to meet peak loads. There are 192 retorts in all, and the capacity is 2½ million c.ft. a day.

As already mentioned, the new Glover-West installation proved of great interest. This house, which was completed in 1927, contains 112 40-in. retorts in two benches. The working capacity is 470 tons of coal a day, making 7½ million c.ft. of gas. The daily throughput of each retort is 4·3 tons. Coal, received by either of two gravity bucket conveyors encircling the benches, is discharged into overhead storage bunkers of 1000 tons capacity. Coke is discharged into the lower portions of the conveyors, and after being raised to the required height passes over screens and is delivered either by drag-bar conveyors to concrete storage hoppers, or by rubber belt conveyors to hoppers which feed the water gas plant. The settings are fired by fourteen producers, one to each bed of eight retorts. There are three waste-heat boilers—so arranged that one is always ready as a stand-by—giving a gross production of superheated steam from two boilers at work of over 20,000 lbs. per hour at 120 lbs. pressure.

Water Gas Plant.

This consists of three Humphreys & Glasgow carburetted water gas units, and has recently been remodelled. Each set is equipped with self-clinkering grate and boiler generator, hydraulic coke charger, back-run process, and waste-heat boiler. The plant is extremely interesting; and we would refer our readers to the descriptive paper given by Mr. C. A. Cunnold at a meeting of the Southern Association last month—see "Journal" for April 13. Coke is delivered direct by conveyor from the vertical retort plant into overhead concrete bunkers feeding the generator chargers. The three units have a capacity of 5¼ million c.ft. per day.

Other Plant.

There was much to see of interest; and though space forbids detailed description, mention may be made of one or two items. There are three Coulson pan ash screening and washing plants; one or more of these being available for the washing and screening of small coke and coke breeze. For the supply of feed water to the waste-heat and Lancashire boilers, approximately 6000 gallons of water per hour of zero hardness is required under full load conditions. A Lassen & Hjort lime plant is used to reduce the water derived from two boreholes to about 5° hardness; and the partly softened water then passes through two quartz filters to a "Becco" zeolite plant, where the reduction to zero is made. There is a new electric power plant consisting of two 300 kw. D.C. generators driven at 375 r.p.m. by 450 h.p. Bellis & Morcom high-speed compound condensing engines. This plant can generate all the electricity required on the works, and is direct coupled to the retort house waste-heat boilers.

There are in all 49 purifier boxes. Among the coal gas sets are eight overhead boxes 58 ft. by 35 ft. by 6 ft. 6 in. in two sections. These, with a revivifying floor above, are constructed in reinforced concrete; and an oxide handling plant with magnetic separator, disintegrator, elevator, and shuttle rubber belt conveyor forms part of the installation. For water gas there are eight reinforced concrete overhead boxes 37 ft. by 40 ft. by 6 ft. 6 in., also in two sections.

The total storage for Nine Elms is 10 million c.ft., but by means of trunk mains storage at Fulham and Westminster may be used. Boosting is done by two sets of Keith Blackman centrifugal exhausters each capable of passing 500,000 c.ft. per hour against a total pressure difference of 28 in. They are utilized to pass gas into trunk mains on the north side of the river for consumption in any part of the Company's district.

The inspection was splendidly organized, and was thoroughly enjoyed. Following it the visitors assembled at Watson House, where, prior to luncheon, they were received by Sir David Milne-Watson, Governor of the Company.

At the luncheon Sir David presided. On his right was the Mayor of Battersea, and on his left Mr. Thomas Hardie, the Chief Engineer of the Company and President of the Association.

After the Loyal Toast had been honoured,

Sir David Milne-Watson, proposing "The Southern Association, coupled with the name of Mr. Thomas Hardie," said it was a great pleasure to him, on behalf of the Directors of the Gas Light and Coke Company, to welcome so many members of the Southern Association of Gas Engineers and Managers to Watson House and to Nine Elms. Their visit had certainly been favoured by excellent weather; and good weather conditions greatly influenced the enjoyment of a gas-works inspection. Thinking of this, however, reminded him that foggy days benefited gas undertakings. The late Governor of the Gas Light and Coke Company, Sir Corbet Woodall, lived in Kent; and on some mornings, though it was sunny in Kent, it was foggy when he arrived in London. But this did not dishearten him. He used to remark: "Isn't this splendid gas weather?" [Laughter.] Nowadays, though, it was when Old Boreas held sway that the Gas Light and Coke Company really came into their own. Sir David said he was certain that Associations such as the Southern did an enormous amount of good for the industry.

Mr. Thomas Hardie, in reply, remarked that the Southern Association was very much alive. It was over fifty years since gas engineers and managers in the South thought it advisable to get together, to interchange ideas; and what had been necessary 52 or 53 years ago was more necessary to-day, when progress was much more rapid than formerly. Nowadays they had to know about electricity, hydraulics, steam, chemistry, and many other subjects besides gas *qua* gas; and from all points of view it was essential that they should meet together if they desired to maintain the present rate of progress. On behalf of the Association, and also personally, he thanked the Governor and Directors of the Gas Light and Coke Company for their hospitality, and the guides and others who had assisted in making the visit such a success. In reading the report of the recent Trade Delegation to America on what had taken place there in manufacture, he had noted two outstanding features of policy which had been adopted by the Gas Light and Coke Company. One was that manufacturing undertakings in America were very willing to interchange ideas; and he was sure that their Company were ever ready to give and to receive information. The other was that in America they had adopted scientific methods of sale as well as of manufacture; and the Gas Light and Coke Company had also done this.

Reason for Increased Gas Demand.

Mr. C. Valon Bennett, proposing "The Directors of the Gas Light and Coke Company, coupled with the name of the Governor, Sir David Milne-Watson," thanked them for their unbounded hospitality. Some of the members of the Association who had visited the showrooms of the Company in Horseferry Road that day had done so for the first time; and he was sure that no one had left the building without being deeply impressed with what he had seen there. Mr. Bennett suggested that it might have been better from an advertisement point of view had such an excellent building been situated in Victoria Street, through which thoroughfare so many thousands passed each day. The Association had also had the opportunity of inspecting the Company's Nine Elms Works, where, he was sure, they had learnt much. They had seen how the problem of increasing the capacity of the works without increasing the ground area was being tackled; and the visit had added to the interest of the recent inspiring address of their President, and of the paper by Mr. Cunnold. Why was it, asked Mr. Bennett, that the demand for gas continued to grow? It was doubtless due to the fact that the Gas Light and Coke Company had shown that the service they offered was essential to the health and well-being of the community; and the gas industry was indebted to the Company, whose Governor was at the head of so many of its organizations. They had no fear so long as the Gas Light and Coke Company stood shoulder to shoulder with the rest of the industry. None of the undertakings represented that day could compare in size with the Gas Light and Coke Company; but perhaps their visit to Watson House that afternoon would indicate methods which could be adopted to advantage by the smaller concerns. The praises of Sir David Milne-Watson had been voiced in every gas boardroom in the British Isles. He trusted that Sir David would be spared for many years to continue his good work for the industry, assisted by his colleagues on the directorate of the Company, and by the officials, in whom all had unbounded faith. He (Mr. Bennett) was proud to think that the work of the Association met with the approval of the greatest gas undertaking in the world, and that the Chief Engineer had found time to act as their President.

The Gas Industry and Low-Temperature Carbonization.

Sir David Milne-Watson, replying to the toast, said he was deeply sensible that, while they were a large Company, they had surrounded themselves by many comrades in the gas industry, and especially in the Southern district. They were sorry not to have with them that day other gentlemen who, owing to pressure of business, had been unable to attend, among whom was Mr. John Wilkinson, President of the Institution of Gas Engineers. They were glad, however, to see Mr. Frank Prentice, President of the Eastern Counties Association of Gas Engineers and Managers. Mr. Bennett had expressed regret that the Horseferry Road showrooms were not situated in Victoria Street. He (the speaker) admitted, of course, that it was a good thing from an advertising point of view to have showrooms in such a thoroughfare as Victoria Street; but, on the other hand, there was decided advantage in remaining in the historic home of the gas industry. The Horseferry Road premises were really a *locus classicus*; for it was there that the manufacture of gas was commenced 115 years ago. They were proud of their claim that they continued if not to manufacture, at any rate to store, gas in the vicinity of the Houses of Parliament; it indicated the vitality not only of the Gas Light and Coke Company, but of the gas industry. Another matter regarding which they were proud was that Pall Mall, first lighted by gas in 1812, was still illuminated by the same medium. He only wished that this fact was more widely known in electrical circles. They were pleased to have with them that day the Mayor of Battersea, especially as he was the technical head of the Borough Electricity Department. He was glad to be assured by the Mayor that the Department was flourishing, for he was sure that much good accrued from healthy rivalry, and there was ample room for both gas and electricity in their endeavour to render the lives of a great section of the city healthier and more comfortable. Both had the same objects. Each was making an effort to free London from smoke and darkness. Then, of course, the Mayor was interested in the Gas Light and Coke Company, as they were large ratepayers. Among their honoured guests, continued Sir David, was Dr. C. H. Lander, the technical head of the Fuel Research Department at East Greenwich. All in the gas industry appreciated Dr. Lander's efforts to solve problems which faced them to-day. From some quarters there had been criticism that the gas industry would not look at low-tempera-

ture carbonization; and he (Sir David) would take this opportunity of saying that, while they carried out their process at high-temperatures—which at present appeared to be the best way—they were prepared to consider the adoption of low-temperature working immediately this was proved successful commercially. As evidence that the Gas Light and Coke Company were anxious to assist progress, they had arranged, in conjunction with H.M. Government, to erect a low-temperature plant at Richmond. He was pleased to see Dr. Lander present, because the work was to be carried out in close conjunction with him, and it was his process that they were going to investigate. Time would show whether the system would be commercially successful. Sir David remarked that he was also pleased to see present representatives of the great manufacturing firms who had helped in the remodelling of the Nine Elms Works, of whose services the Company had gladly availed themselves.

Competition Good for Progress.

The Mayor of Battersea, speaking of gas and electricity, observed that it was for the future to decide how far one would supersede the other. Electricity, he thought, had wakened gas up; but after inspecting the Horseferry Road showrooms, it seemed to him that the Gas Light and Coke Company were in this respect going to awaken the electricity departments. Of course, all progress was achieved in this manner; for if an industry received no challenge, there was a tendency for it to go to sleep. They would ultimately find for what purposes gas and electricity were best suited, and thereby they would be serving the interests of the community, which must necessarily come before the interests of the individual.

Dr. C. H. Lander thanked Sir David Milne-Watson for his help in the organization with which he (the speaker) was connected. Through this help they would be able to carry out a proper trial of a low-temperature process. As a result of the investigation, their knowledge of the commercial prospects of low-temperature carbonization would be greatly increased.

Watson House.

Following the luncheon, the visitors inspected Watson House—the scientific and technical training centre of the Company which was described and illustrated in the "Journal" for Nov. 24, 1926, p. 489. Some idea of the magnitude of the premises will be gained when it is mentioned that the floor area is 146,000 sq. ft., and that, on the ground floor of this four-storey building, 60 miles of barrel is stored. The Company, by the way, use 800 miles of barrel a year, and about 2½ million barrel fittings in the same period.

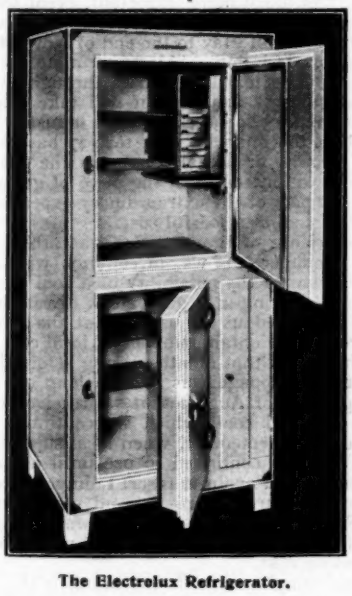
The idea at Watson House is to reproduce in modern form the advantages of the old apprenticeship system. Here, training is given to three classes of employees in the Gas Sales Department. First, about fifty boys of 14 to 15 years of age—fitter apprentices—are each year started on a five or six years' course of technical training combined with general education. The practical training is carried out in the machine shop, the smiths' shop, and the carpentry shop at Watson House; the rest of the course being given under the direction of the London County Council at the Westminster Technical Institute. Secondly, pupils of 17 to 18 years of age are each year started on a more advanced five years' course of training in the work of the department. In this case again, part of the training is given in the laboratories, shops, and demonstration room at Watson House, and part at the Westminster Technical Institute, where pupils study for the Diploma in Gas Supply of the Institution of Gas Engineers. Thirdly, there are facilities for instructional courses for fitters and all ranks engaged in the supervision or execution of practical work in the department.

Tea at Watson House concluded a visit which was thoroughly appreciated by all who participated in it.

ELECTROLUX REFRIGERATORS.

Inauguration of New Works at Luton.

In the "Journal" for March 3, 1926, p. 534, reference was made to the birth of the "Electrolux" refrigerator—a motorless apparatus to function with gas or electricity. In view of the growing need for cold-storage in the household, and realizing the potentialities of their refrigerator (which was described in the issue referred to above), the Directors of Electrolux, Ltd., set early to work to find suitable accommodation to manufacture in this country. After considering a number of propositions, the Company, barely a year ago, acquired the buildings of an old aeroplane factory at Luton, and prepared and equipped them for the manufacture of the refrigerators and cleaners on mass-production lines. The general



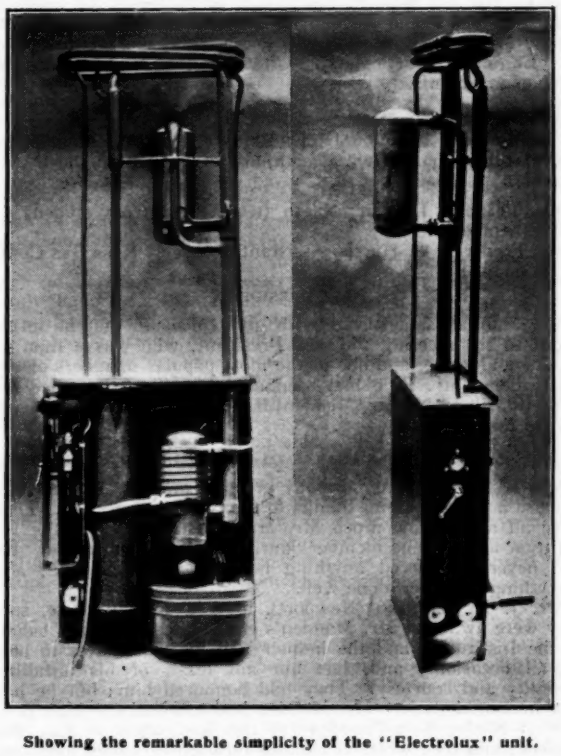
The Electrolux Refrigerator.

lay-out of the factory (which is equipped throughout with British machinery) is arranged on a system to give the greatest facility to high production, with the result that the ideal position has been achieved whereby raw materials enter at one end, and the finished products emerge at the other.

The works were inaugurated on Wednesday last by the Rt. Hon. Sir Robert Horne, G.B.E.

Following the inauguration ceremony, the company made a tour of inspection. Passing in groups through the 63 sections comprising the factory, the visitors were enabled to witness the process of manufacture of the refrigerators and cleaners from the raw materials to the finished articles. Not the least interesting feature of the works is a plant (one of the most modern in the country) for depositing on the steel linings of the refrigerator a perfect surface of pure porcelain. After application of the porcelain, the articles treated are placed in a continuous conveyor, and pass automatically into a drying chamber, thence to a Gibbons gas-heated oven.

Major H. A. Wernher, the Chairman of the Company, in the course of an address, explained the history of Electrolux,



Showing the remarkable simplicity of the "Electrolux" unit.

Ltd. In 1922 the Swedish Company (who have branches in almost all parts of the world) decided to import vacuum cleaners into this country. In 1926, a British Company, with a capital of £1,000,000, was formed for the purpose of manufacturing a motorless refrigerator, and selling Swedish vacuum cleaners, in the British Isles and the Colonies. It has recently been decided, as a matter of policy, and in the face of strong foreign competition, to manufacture the greater portion of the cleaners at the Luton factory, which is the only one in England to make these articles, and on a scale far eclipsing anything attempted before.

Electrolux, Ltd., may justly claim to have founded a new industry in this country.

WALES AND MONMOUTHSHIRE DISTRICT INSTITUTION OF GAS ENGINEERS AND MANAGERS.

GENERAL MEETING AT ABERGAVENNY.

There was an unusually large attendance of members in the Town Hall, Abergavenny, on Thursday morning, May 19, when a general meeting of the Institution was held. On arrival, they found the most cordial of welcomes awaiting them at the hands of the Mayor (Alderman W. Rosser) and members of the Corporation; while the new President, Mr. A. T. Kyle (who is Manager of the Abergavenny Gas-Works) had made every possible arrangement for their comfort. At the opening of the business proceedings, the chair was occupied by Mr. H. D. Madden, M.Inst.C.E., of Cardiff (the outgoing President).

A Welcome.

The Mayor said it was not only his duty, but a matter of considerable pleasure, to welcome the Institution heartily to Abergavenny. The members of the Corporation, and, in fact, the whole of the townspeople, associated themselves with this welcome. The gas undertaking at Abergavenny was reckoned among their most successful ventures. This was not surprising when one remembered the fact that they had a very efficient Chairman and Engineer. They were in the happy position of possessing in Mr. Kyle a Manager who knew how to "keep his end up." He offered to Mr. Kyle sincere congratulations on having attained the high position of President of that Institution; and he had no doubt that when the time arrived for him to make way for his successor, the members would feel no regret at having elected him. ["Hear, hear."]

Mr. Madden said that when they heard they were coming to Abergavenny they much appreciated the idea of the visit, not only because they knew they would receive the welcome that had been extended to them, but because they felt they did not know well enough the glorious country round about. Mr. Kyle was respected among the members in the same way that he evidently was at Abergavenny. He was keen on the Institution, and always to the front when work had to be done.

Minutes.

The Hon. Secretary (Mr. Octavius Thomas, of Pentre) read the minutes of the last general meeting, and they were confirmed. He also notified the receipt of apologies for absence from Presidents and Secretaries of various kindred Associations. Mr. John Wilkinson (the President of the Institution of Gas Engineers) particularly regretted his absence, owing to other engagements.

New Members.

On the proposition of Mr. E. Petty (Hirwain), seconded by Mr. Madden, the following additions were made to the list of members:

Mr. Fernand Dupont, Neath (transferred from student to member).

Mr. Frederick C. Harris, Assistant Manager, Ross Gas Company, Ltd.

New President.

Mr. Madden said it was with great pleasure that he introduced to the meeting the new President, who was a man of good sound sense, and one of the most popular members of the Institution. Mr. Kyle had been actually filling the office for some time; and he (Mr. Madden) had now only formally to ask him to take the chair.

Vote of Thanks to Mr. Madden.

Mr. Kyle, who was cordially greeted, at once proceeded to propose a hearty vote of thanks to the retiring President. They were all aware how much Mr. Madden had done for the Institution and for the members during his period of office. He had never considered anything he could do a trouble; and everything had been done well.

Mr. J. H. Canning (Newport), in seconding the vote, said they were aware of Mr. Madden's efforts at all times on behalf of the Institution and the industry, of his willingness to help on all occasions, and, last but not least, of his unfailing geniality and courtesy. They had honoured him; but he had also honoured them. Mr. Madden had attained the high position of Senior Vice-President of the Institution of Gas Engineers; and they were all looking forward to seeing him next year in the Presidential Chair of the parent Institution. ["Hear, hear."] It would be the first time that this great honour had come to this part of the country; and, of course, it was not for them to make any suggestions in the matter. He did hope, however, that the Institution of Gas Engineers would consider the question of holding their next meeting in that district, because they would all like to do honour to Mr. Madden in his adopted country. [Applause.]

Mr. Madden assured them that it had been a great pleasure for him to occupy the chair of that Institution for a second time. The aim of the gas industry was service to the community; and it was the duty of every one of them to do his best for the District Associations.

PRESIDENTIAL ADDRESS

of A. T. Kyle, of Abergavenny.

My first duty must be to express my sincere appreciation and thanks for the honour you have conferred upon me by electing me President of our Institution for the ensuing year. When I consider the names and abilities of the very distinguished gentlemen who have previously held this position, I have very great doubt and many misgivings as to my worthiness and ability to carry out successfully all the duties and obligations belonging to the high office of President. However, knowing my own limitations, I will endeavour to carry out those duties to the best of my ability, and I hope to your satisfaction, if you will help me by your assistance and indulgence. I think the majority of my predecessors have been engineers and managers of large undertakings; and it appears to me to be somewhat of a novelty for you to elect as President the Manager of a small works. It is from a small works point of view, and in relation thereto, that I address you this morning.

The General Strike and Coal Stoppage.

Before doing so, however, I desire to say a few words about matters that have affected both large and small works during the past year. Perhaps you will pardon me if I go back to events that are now almost ancient history, but the effects of which we are still feeling. I allude to two events particularly—viz., the general strike and the coal stoppage. The first of these, which took place from the 4th to the 14th of May last year, was the one which had the less effect upon our industry, but which, if it had continued, would have had much more disastrous results than the coal stoppage. This is neither the time nor the place to speak of the wisdom or otherwise of the course of action taken by the persons responsible; but no one can deny the universal relief felt throughout the country when the general strike was called off after ten days. I do not think that the gas industry really felt any ill-effects from the general strike, as it was not of sufficient duration for much harm to be done; but one thing it did, and that was to demonstrate the loyalty of practically all gas workers, who showed their good sense and judgment by sticking to their work during the crisis, and emphasized the good feeling existing between the employers and the gas-works employees. Personally, I do not know of any one gas-works where the men came out during the general strike; and it all showed that gas workers were keenly alive to the advantages of keeping to their work, and of maintaining one of the most important—if not actually the most important—of the public services to the community.

The second, and much more important, event was, as I have previously stated, the complete stoppage of the whole of the collieries from the 1st of May to the end of November—a period of seven months. It is impossible to estimate the almost irreparable damage done to all industries through this deplorable stoppage of supplies of fuel; and it will take a long time for recovery to be made. So far as the gas industry is concerned, I am afraid that the financial year 1926-27 has resulted in big reductions of profits, or actual losses, on the year's working, notwithstanding the increases in the price of gas which had to be made to meet part of the extraordinary expenditure incurred in having to buy coal at a fearful cost.

My own experience of the stoppage was probably similar to that of other managers, as we, in common with other works, had, in anticipation of the possibility of a coal stoppage, taken the precaution of getting-in a good stock of coal by the end of April; and this carried us on until about the middle of July, when we were able to obtain supplies of local coal that kept us going until the end of that month. Long before this it became apparent that the stoppage was to be a long one; and it was about the beginning of August that we received our first consignment of imported coal, which we continued to use until about the middle of September, when local supplies were again available. These we continued to use until about the end of October, when we had again to resort to imported coal until the end of November. Just before the end of November, as you know, the termination of the stoppage was in sight, and our immediate difficulties were over. We had weathered the storm, but at tremendous cost.

The one redeeming feature, to my mind, is the fact that the gas industry carried on so well, and kept-up supplies of gas under such adverse conditions; and I think I am right in stating that in only a very few isolated cases were the supplies of gas terminated. I should like at this point to express a personal note of thanks and appreciation of the services rendered to the industry in South Wales and Monmouthshire by Mr. Finlay Gibson and his staff, in their efforts to keep all the gas-works going in our own area, and for the great amount of trouble they took to obtain this end. I must also thank the South Wales Coal Sub-Committee—and particularly their Secretary, Mr. W. Clark Jackson, who had a great deal of work to do in this matter, and who spared no pains to get a supply of coal to any gas-works whose stocks were almost exhausted. So well did the Sub-Committee and Mr. Jackson work, that the South

Wales undertakings can congratulate themselves on having bought imported coal at a much lower price than was paid anywhere else in the kingdom.

It is impossible to put into £ s. d. the amount of worry, trouble, and anxiety that the manager of each gas undertaking had to contend with in his efforts to keep his works going; but it is possible to show the great increase in the cost of production that resulted from the coal stoppage. Our cost of production in coal alone was increased by £1840, which equalled 9½d. per 1000 c.ft. of gas sold.

SMALL UNDERTAKINGS AND THE PRICE OF GAS.

Having touched upon these two important matters, a few other points occur to me which affect small gas undertakings, and which, while well known to all of you, may be of some interest generally.

One point on which we managers of small works—and particularly those of us who are managers of works belonging to local authorities—hear a great deal of criticism is that of the price of gas compared with prices charged by large undertakings. The selling price of gas is governed by the cost of production; and the latter is greatly influenced by the condition of the plant, as to whether it is modern or nearly out of date, and by local conditions, which vary in nearly every district. It is quite obvious that, owing to the large quantity of gas made, certain charges or costs in large works are less proportionately per 1000 c.ft. sold than in small works; and those large undertakings—making, as a rule, much more profit than a small works—are in a position to instal all those mechanical appliances and labour-saving devices which tend towards the cheapening of production, and the consequent reduction of the selling price. There are, of course, other important matters bearing upon this subject which have an effect upon cost of production and selling price; but the conditions obtaining in a large works are altogether so different from those in a small works that a comparison is hardly reasonable.

We also get some criticism of the price of gas now as compared with pre-war charges. Bearing upon this point, and as a matter of interest, I give several analyses showing our cost of manufacture, maintenance, and distribution, and including all charges at our own works, for the years 1911, 1914, 1921, and 1926—each year ending on March 31.

Cost of Manufacture, Maintenance, and Distribution of Gas per 1000 C.Ft. at the Abergavenny Gas-Works.

Manufacture.	1911.	1914.	1921.	1926.
	Pence.	Pence.	Pence.	Pence.
Carbonizing—Coal, &c.	13·94	18·53	52·3	27·5
Wages	3·70	3·92	11·7	7·1
Purification	0·46	0·52	2·2	1·4
Salaries, one-half	0·99	1·08	2·3	1·4
Yard labour, repairs to plant, &c.	2·18	2·16	5·4	3·8
Retort repairs	..	0·98	3 0	0·4
Water, &c.	0·21	0·16	0·7	0·5
Cartage and sundries	0 78	0·62	2·7	1·3
	22·26	27·97	80·3	43·4
Less—Residual products	9·17	10·05	32·3	16 6
Net cost of manufacture and maintenance	13 09	17 92	48·0	26·8
Add—Cost of distribution—				
Mains, services, meters, and stoves	1 90	1·64	5·2	10·4
Salaries, one-half	0·99	1·08	2·3	1 5
Proportion Town Clerk and collectors' salaries, bad debts, rents, rates, and taxes	5·46	5·59	10·3	8·9
	21·44	26·23	65 8	47·6
Less—Miscellaneous receipts—				
Meter and stove rents, fittings, &c.	1·22	2 64	3·1	4·0
Net cost of manufacture, maintenance, and distribution	20·22	23·59	62·7	43·6
Add—Interest on loans, deposits, sinking fund, and income-tax	9·04	8·71	10·0	9·0
Total net cost, including all charges	29·26	32·30	72·7	52 6
Total cost per 1000 c.ft. sold	2s. 5¼d.	2s. 8¼d.	6s. 0¾d.	4s. 4½d.

These figures are not submitted with any idea of comparison with those obtaining at other works of a similar size to our own, but simply with the idea of showing in a general way what causes have contributed to the great increase in the cost of production; and I expect that these increases may be accepted as generally applying to most small undertakings in South Wales and Monmouthshire. An almost casual glance at the figures will reveal where the great increases have occurred; and if it is assumed that the increased cost of coal, material, and labour have brought things to the pitch at which they have been and are at present, then we have pretty well accounted for the difference between the cost of manufacture now and pre-war.

It will be seen that in 1921 our cost of coal per 1000 c.ft. of gas sold had increased by 182 p.ct., and carbonizing wages by 200 p.ct., as compared with 1914; the increased labour cost affecting the whole of the charges of the undertaking. Against this must, of course, be set the increased revenue from residuals; but unfortunately this has also slumped very considerably, and there has been a steady decline since 1921. The costs of coal and wages in 1926 show almost 100 p.ct. increase over those of 1914. I have not given you the cost of coal for 1927, which included the coal stoppage, for the figures are altogether abnormal through extraordinary circumstances which we all hope will never occur again.

As I have previously mentioned, all these increases and decreases govern the prices at which we are able to sell gas, with perhaps a little profit left at the end of each year; and, as a matter of interest, I have taken the pre-war selling prices of gas of about a score of works in South Wales and Monmouthshire, of about the same size as Abergavenny, and find that the charges ranged from 3s. 2d. to 4s. 6d. per 1000 c.ft. I am giving the figures in this form, as I think the average gas consumer, even now, speaks of the price of gas as so much per 1000 c.ft., and not per therm. Just prior to the coal stoppage, the prices ranged from 4s. 6d. to 6s. 6d. at these same works, which seems to indicate an increase of less than 50 p.ct. In view of the increases in the cost of coal and wages previously mentioned, I do not consider that the prices are exorbitant or out of reason. I am sure we are all only too anxious to get back to our old prices, if circumstances over which we appear to have little or no control will allow us.

NECESSITY FOR TESTING FACILITIES.

The interests of each gas manager are centred in his own undertaking; and he naturally does his best—so far as his Directors or Council will allow—to keep his works as up to date and efficient as circumstances will permit. We managers of small works sometimes have the opportunity of inspecting the plant of a large undertaking; and when we see all the latest labour-saving machinery, testing apparatus and appliances, well-equipped laboratories, and other modern devices for ensuring that a full and efficient service of gas is maintained, we realize that some of us are not working under the best conditions, and that much more is needed in a small works to put us in a position to ensure such a service being available to all our consumers at all times.

This brings me to another of the points I wish to emphasize. Unfortunately, some of us—owing to various causes over which we have no control—have to rely upon simple tests or "rule-of-thumb" methods to tell us how we stand, not only on the works, but also on the distribution side. This "rule-of-thumb" or "taken-for-granted" attitude is, of course, entirely out of date; and if a manager of a works, no matter how small, is to keep up an efficient service, he should have all the necessary means at hand to enable him to do so. He should be able to ascertain with some degree of accuracy how he stands at any point in his manufacturing and distributing plant; and for this reason I particularly emphasize the necessity of having a small laboratory with the requisite apparatus to enable him to make various tests of the actual purity and composition of the gas he is making and supplying.

It is not at all necessary to have an elaborate laboratory, such as we see in large works; but a small room should certainly be provided where tests to ascertain the amounts of impurities in the gas at various points could be made. If we are not all expert chemists, we probably possess sufficient chemical knowledge to enable us to make such tests as I have mentioned. To my mind, this part of the manufacturing side in a small works does not get the attention or opportunity it should have.

Turning to the distribution side, which I think is quite as important as the manufacturing side, I deprecate the "rule-of-thumb" methods upon which we have in many cases to rely. There should be no stint in reason—particularly from an economical point of view—of the necessary appliances to enable a manager to give a really efficient service. If these appliances are provided, the question becomes one of personal and continuous attention; and no manager begrudges this.

UNACCOUNTED-FOR GAS.

I should like to say a few words about leakage or unaccounted-for gas. I prefer the latter term, because all the gas unaccounted-for is not always leakage. You are very well aware of all the factors that enter into the question of unaccounted-for gas; and I do not propose to say anything about them, with perhaps one or two exceptions. The trouble of actual leakage from defective mains and services we always have with us; and this is dealt with as it should be.

Our percentage of unaccounted-for gas in Abergavenny is rather high; the latest available figure being 7·8. I say it is rather high, because we are not subject to the extraordinary conditions which obtain in some other towns in South Wales and Monmouthshire through local subsidences. Abergavenny is an old town; and in numerous cases the mains and services have been in for many years, and at various points are very shallow. From what I have found in searching for leakages, I am convinced that unaccounted-for gas did not seem so important in years gone by as we know it to be at present; and many of us are now suffering for past indifference in this important matter. I have found live service pipes, leading nowhere, stopped-up with corks, and on one occasion came across a 3-in. main with

a wooden plug in the end. I have also found many ½-in. lead services laid to large houses. It makes one wonder how many more such cases there are, the whereabouts of which are unknown, but which may considerably swell the unaccounted-for gas until unearthed and remedied.

DEFECTIVE METERS.

I think, however, that there is another very important factor which enters into this question. I refer to defective meters, which fail to register under a certain consumption per hour, register slow, or do not register at all. I submit the actual results of the official tests of the last hundred meters we sent away for examination.

6	were	5 to 10 p.ct.	fast	
13	,,	up to 5	,,	,,
23	,,	correct		
2	,,	up to 5	,,	slow
10	,,	5 to 10	,,	,,
10	,,	10 to 20	,,	,,
5	,,	20 to 30	,,	,,
3	,,	30 to 40	,,	,,
2	,,	40 to 50	,,	,,
1	was	over 50	,,	,,
25	passed gas without registering			

Of the 58 which were slow or passed gas without registering—

3	would	not	register	under	3	c.ft.	per hour
4	,,	,,	,,	,,	4	,,	,,
3	,,	,,	,,	,,	5	,,	,,
1	,,	,,	,,	,,	6	,,	,,
3	,,	,,	,,	,,	8	,,	,,
2	,,	,,	,,	,,	10	,,	,,
5	,,	,,	,,	,,	12	,,	,,
2	,,	,,	,,	,,	22	,,	,,
1	,,	,,	,,	,,	24	,,	,,
1	,,	,,	,,	,,	28	,,	,,
2	,,	,,	,,	,,	30	,,	,,
1	,,	,,	,,	,,	40	,,	,,
1	,,	,,	,,	,,	78	,,	,,
1	,,	,,	,,	,,	192	,,	,,

I have given these tests in detail, as I think the results are so extraordinary as to be startling.

The figures convince me that this matter of defective meters is one of great importance in dealing with the question of unaccounted-for gas. It is necessary to give the matter all the attention it deserves; for unless the point of incorrect registration is very carefully watched and remedied, we shall find our percentage of unaccounted-for gas going from bad to worse. In our own case, at each quarter-end every consumption is compared with previously corresponding consumptions; and where there is any doubt about the meter being correct, or where no satisfactory reason can be given for a reduction in the quantity of gas consumed, the meter is taken out and replaced by another in proper registering condition. I think we lose a lot, too, in those cases where meters pass gas without registering when the consumption is under a certain number of cubic feet per hour. I have in my mind the by-pass lights of shop lamps and domestic burners, which consume gas that may not be registered by the meters. A large number of these spread over the district would amount to a very big figure at the end of the year, and would all be included in the unaccounted-for figure.

I therefore feel that we cannot give too much attention to this matter, and am convinced that any cost incurred in keeping meters in proper registering condition will be amply repaid—particularly that of replacing old meters which have been in use for considerably too long a period. I am afraid that some of the figures I have given are due to this. The only remedy is to remove all old meters, and replace them with new ones. The cost will soon pay for itself.

DESIRABILITY OF A SHOWROOM.

Another drawback some managers of small works have to contend with is the lack of a showroom. Any business person who has anything to sell provides for a display of his goods; and no gas undertaking is complete in its service to its consumers if a showroom is not provided. The gas manager without a showroom is unable to push his business properly, and show his customers what can be achieved by gas when used in the proper manner, and with the most suitable fittings and appliances. I advocate a showroom—no matter if it is on the small side—for every gas-works, in a prominent and easily accessible position, where a display of all the latest burners, fittings, and appliances can be shown to consumers. All of you who are fortunate enough to possess showrooms know that in selling the best materials you are helping towards a satisfactory service, and at the same time preventing complaints of what is generally called "poor" or "bad" gas, when very often the complaint is due to obsolete or cheap fittings, burners, or appliances. I have had many such complaints, only to find that the gas was being used through an entirely obsolete burner, or one which had been purchased for a few pence. While the principal object of a showroom is a display of the best methods of using gas, another consideration is the amount of revenue resulting from the increased sale of gas through additional appliances being brought into use, owing to consumers having been induced to adopt such appliances because they have been brought to their notice by a display in the showroom.

In short, I am convinced that, no matter how small a works may be, a showroom is absolutely necessary if progress is to be made.

CONCLUSION.

Summing-up the position of the small works, it appears to me that efficiency is sometimes sacrificed for the sake of what I call "false economy." This should not be, and any reasonable expenditure on the lines I have indicated, with the view of maintaining a full and efficient service of gas, would be money well spent, and would repay itself by a satisfactory service being constantly maintained.

I have purposely kept away from the technical side, as I have endeavoured to state my own personal views on various points as they affect small gas-works, where improvements could be made; but even if technical matters have been left out, and nothing new introduced, I hope my remarks have been at least interesting to all of you.

I desire to draw the attention of the younger members of the Institution, and of those members who have assistants, to the Education Scheme of the Institution of Gas Engineers. Some progress has been made, and classes have been held in Gas Engineering and Gas Supply at the Cardiff Technical College, the Principal of which is anxious to do all in his power to help the classes. Difficulties have arisen owing to the scattered nature of this district; and arrangements are being made for courses in Gas Engineering and ancillary subjects on one whole day per week throughout the winter session. It is hoped that those in authority will allow their assistants to take advantage of these privileges, which will be to the benefit of all concerned. The Council have been successful in obtaining very competent teachers; and Mr. Madden kindly allows students frequently to visit the Grangetown Gas-Works, where the latest systems of gas manufacture and bye-products recovery can be seen.

THANKS TO THE PRESIDENT.

Mr. W. H. JOHNS (Swansea), proposing a hearty vote of thanks to the President for his address, said he was in agreement with practically everything which was contained in it. Mr. Kyle had emphasized the fact that he was the Manager of a small works; but the address proved conclusively that he was a very capable one. Clearly the Institution had made no mistake in selecting him for the office of President. It was necessary, in these days of keen competition, that the managers of small undertakings should have at their disposal efficient plant and staffs to enable them to deal with this competition. In referring to the desirability of having showrooms, the President had touched upon an extremely important point. A showroom was absolutely indispensable to-day to any well-managed undertaking. In Swansea people went to the showrooms to pay their accounts; and in going to the counter they passed through the part of the premises in which modern gas appliances were displayed, and so acquired knowledge which would not otherwise have come to them. The effect of this was to increase the output and decrease the cost of production of gas, thereby benefiting the community. When criticisms were made of the price charged for gas by small undertakings, it should be remembered that in many cases undertakings had been transferred from company to municipal ownership, and that sometimes the purchase price had been such that the manager had for many years to bear a heavy burden in the shape of interest and capital repayment charges. This, of course, had a tendency to keep up the price of gas. On the other hand, by means of the sinking fund the capital indebtedness was being gradually wiped out; and this in time had the effect of bringing about a reduction in the price of gas.

Mr. E. ABLETT (Swansea) seconded the vote, and congratulated the President upon his address. The details given of the items which went to make up the cost of gas were interesting; and it was evident that the present position of the Abergavenny gas undertaking had been reached through the clear and long-sighted policy of Mr. Kyle.

MEMENTOES FOR PAST-PRESIDENTS.

The MAYOR, called upon by the President, then presented inscribed medallions, in cases, to all the living Past-Presidents of the Institution. He remarked that it was an excellent idea to present these gentlemen with something which would remind them of their period of office.

The following is a list of the recipients, with the years during which they held office. All, with the exception of Mr. R. G. Clarry, M.P. (who was represented by his brother, Mr. E. H. Clarry), were present in person to receive their medallions.

Mr. J. H. Canning	1910 and 1920
Mr. E. H. Swain	1911
Mr. T. E. Franklin	1912
Mr. H. D. Madden	1913 and 1925
Mr. J. E. Kenshole	1916
Mr. J. Mogford	1917
Mr. R. G. Clarry, M.P.	1918
Mr. A. J. Bond	1919
Mr. O. Thomas	1922
Mr. W. C. Jackson	1923
Mr. W. H. Johns	1924

PRESENTATION TO THE HON. SECRETARY.

The PRESIDENT said he now came to a very pleasant duty, which was not down on the agenda. He had been asked to make a presentation to their esteemed Hon. Secretary, Mr. Octavius Thomas, as a mark of their appreciation of the eminent services he had rendered to the Association, from the time of its formation, some twenty-one years ago, down to the present day. Mr. Thomas had done a tremendous lot of hard work for them; and they all held him in the highest regard.

Mr. J. E. KENSHOLE (Merthyr) said it had been felt that Mr. Thomas's long and valuable services should receive tangible recognition; and when the idea was mooted, everybody enthusiastically took it up. Mr. Jackson undertook the duties of Secretary; and subscriptions flowed in from all quarters. This showed how highly Mr. Thomas's services were appreciated by the members. He well recollected the first meeting of the Institution in Cardiff. There were present then some dear old friends who had since passed away, and who, had they been with them now, would have spoken highly of Mr. Thomas's work and of the kindness and consideration which he had invariably shown to every member. Whenever a manager was appointed to South Wales from outside the district, Mr. Thomas at once got into touch with him, and offered him a hearty welcome to the Institution. In many quarters this had been keenly appreciated. He thought they had the best Secretary of any District Association in the kingdom.

Mr. J. H. CANNING (Newport) expressed his pleasure at having the opportunity of saying a few words with regard to Mr. Thomas's services. He, too, remembered their first meeting; and he would never forget the great and constant kindness he had ever since received at the hands of Mr. Thomas, whose chief characteristic was forgetfulness of self coupled with thoughtfulness for others. His first question, in any emergency or trouble, was: "What can I do to help?" This was a spirit which was all too rare; and when they met it they should feel grateful. Mr. Thomas should not accept this gift as a recognition of his services, but as testimony to the love they all felt for him. They were thankful that he had been spared to them for so long, and hoped that they might have him with them for many years yet to come.

Mr. MADDEN recalled that it was twenty years ago that month that he attended his first meeting of the Institution, when, as a total stranger, he came down to that district from London. At that time Mr. Thomas took him in hand; and ever since he had watched over him as he had over others, just like an elder brother. This gift was a proof of their affection, and to mark the fact that under Mr. Thomas's care the Institution grew from a weakling into a giant. They honoured him in Wales; and he was honoured in London among the big men of the profession. He did not know anyone whose opinion was more sought after and relied upon by people in high authority in the Metropolis.

The PRESIDENT then, on behalf of the Institution, asked Mr. Thomas to accept a gold watch and chain together with a case containing sleeve links and studs, as a mark of the affection and gratitude of the members. The watch bore the inscription: "Presented to Mr. Octavius Thomas by his brother Engineers in South Wales and Monmouthshire—1927."

Mr. THOMAS, who was greeted with applause, said he really did not see the necessity for this handsome gift. He was only too pleased to give service; and he wished everyone else would follow in his footsteps. The great thing lacking in the country to-day was service.

ANNUAL REPORT AND ACCOUNTS.

In their twenty-second annual report, the Council stated that the number of members on the roll at the end of the year was 72, together with 8 students and 3 honorary members. The receipts for the year amounted to £79 4s. 6d.; and the payments to £67 6s. 5d., leaving, with the balance brought forward from the previous year, the sum of £46 3s. 0d. in the hands of the Treasurer, and £100 of 2½ p.ct. Consols.

Classes in Gas Engineering and Supply have been held at Cardiff. The attendance has been satisfactory; but the Council consider that more advantage should be taken of the classes.

Mr. CANNING, as Treasurer, remarked that the Institution were to be congratulated upon the flourishing state of their finances.

The report and accounts were adopted, on the proposition of Mr. D. W. DAVIES (Tredegar), seconded by Mr. KENSHOLE.

NEW PRESIDENT.

The PRESIDENT proposed as his successor in the chair Mr. D. W. Davies, of Tredegar, who would, he was convinced, fill the office with distinction.

Mr. KENSHOLE, seconding, said he had known Mr. Davies personally for some years, and had formed a very high opinion of his ability. The results he was getting at his works reflected great credit upon him.

Mr. DAVIES said he would endeavour to justify the confidence the members were reposing in him.

LIST OF OFFICE BEARERS.

The following is the list of officers appointed for the ensuing year:

President.—Mr. D. W. Davies, of Tredegar.
Vice-Presidents.—Mr. F. Boardman, of Cardiff, and Mr. J. E. Kenshole, of Merthyr.
New Members of Council.—Messrs. J. H. Jones (Dowlais), L. Murray (Blaina), and A. G. Lofthouse (Pontardawe).
Hon. Treasurer.—Mr. J. H. Canning, of Newport.
Hon. Secretary.—Mr. Octavius Thomas, of Pentre.
Hon. Auditors.—Mr. A. E. Davey, of Aberdare, and Mr. T. Wilkinson, of Abercarn.

Mr. KENSHOLE remarked that he accepted the Vice-Presidency on the distinct understanding that the Secretary would find someone else to fill the position next year. He had already been President, and wished to see the office go round to every member of the Institution.

INSTITUTION BENEVOLENT FUND.

The HON. SECRETARY said that this year other District Associations had doubled their subscriptions to the Benevolent Fund of the Institution of Gas Engineers, for which more money was needed. He proposed that on this occasion the subscription of their Institution be £10 10s., instead of the usual £5 5s. Any member who did not already subscribe individually to the fund would, he hoped, see his way to do so.

Mr. MADDEN seconded the proposition (which was agreed to), and pointed out that there were cases of real hardship—of gas engineers and widows who, through no fault of their own, had fallen on evil times. The activities of the fund were somewhat hampered by lack of funds; and he earnestly appealed to every one of them to do all possible to help on the good work.

SERVICE TO CONSUMERS.

Mr. W. CLARK JACKSON (Neath) submitted a paper entitled "Service to Gas Consumers," consideration of which was, through lack of time, adjourned until the next meeting.

The paper follows this report.

ACKNOWLEDGMENTS.

On the proposition of Mr. J. MOGFORD (Cardiff), seconded by Mr. DAVEY, a hearty vote of thanks was passed to the Mayor and Corporation of Abergavenny for all they had done to make the meeting the success which it was.

The decision as to the place of next meeting was left with the Council.

HOSPITALITY.

After the meeting, the members were the guests of the Mayor and Corporation at luncheon in the Angel Hotel; and later in the afternoon tea was provided by their hosts at Abergavenny Castle. The Corporation's hospitality did not end here; for, in addition, the visitors were afforded the opportunity of enjoying a game of bowls or a drive round the district. By the members of the Institution, the beautiful Vale of the Usk will not be the only thing by which Abergavenny will long be remembered.

WALES AND MONMOUTHSHIRE GAS GOLF ASSOCIATION.

The Monmouthshire Golf Club kindly made the members of the Institution honorary members of their Club for the two days of the meeting; and on the Wednesday afternoon some twenty of the members held a competition. It was under medal rules, for a silver cup which has been presented by Mr. T. E. Upjohn, of Birmingham—the winner receiving a small replica as a souvenir. The Cup was presented at the luncheon to the winner, Mr. W. Clark Jackson, who returned the excellent score of 72 (79–7). Mr. R. J. Auckland was the runner-up with 76 (84–8).

SERVICE TO CONSUMERS.

By W. CLARK JACKSON, of Neath.

At our May Meeting held at Porthcawl in 1925, our esteemed Ex-President, Mr. H. D. Madden, read a paper on "General Sales Propaganda," which contained a number of timely suggestions. Since then, various other writers have pointed out the necessity for the service side of the gas business being looked into more carefully than it has been in the past; and though it is possible that many of the points raised to-day will seem like a repetition, the subject is so vital to the industry, particularly in view of the keener electrical competition which will have to be faced in the near future, that no apology is needed. The "Education of the Consumer," and "Service to the Consumer," are factors which, if carefully and systematically carried out, will prove of material advantage, and will enable the industry to face, with every assurance of success, this keener competition from our electrical friends and other interests—namely, oil and coal.

CHANGED CONDITIONS.

The gas industry to-day stands on a different footing from what it did in the past, when it was practically a monopoly industry and business came along without any great efforts

being made either to get it or to keep it. To-day, it is on the same footing as the other large industries in this country, having to depend upon its ability and merit to give such service to the public as will induce them to take gas, and retain gas, as their means of lighting and heating, against the service offered by competitors.

Service does not mean price of gas *versus* price of electricity or oil. It includes the ease, cleanliness, and reliability with which gas can be used by the consumer; and cheapness of gas alone will not retain business and what we ultimately aim at—namely, satisfied consumers.

The works can provide and supply gas of a constant calorific value and specific gravity (the latter being nearly as important as the former); the distribution engineer can provide mains and services of such ample size as will enable the gas to be supplied to the consumer in such volume and at such pressure as will suit his requirements; the gas appliances, as originally supplied, can be of the best design. With all these, however, there is still no surety of satisfied consumers at the end. The something lacking is what I suggest falls within the title of my short paper, and includes the education of the consumer in the efficient use of gas for the required purpose, the regular visits of qualified and courteous gas officials to ensure that the gas is continuing to be used at the greatest efficiency and to the satisfaction of the consumer, and, lastly, the general tone of the gas undertaking in dealing with the consumer.

The Question of Tone.

I mean by this last point to include all correspondence with the consumer from the gas office, the method of rendering and collecting his accounts, and the manner in which queries, whether large or small, raised by the consumer, are dealt with.

Many a member on the staff of a gas undertaking has had reasonable cause to grumble when, after long and patient efforts have been made by him to bring about success with some consumer, he finds that his efforts have been rendered almost useless by some curt communication from the gas office—maybe even from the gas manager himself.

Officials of public supply undertakings require to remember that to be successful, they must on many occasions sink their own personal feelings when dealing with their public, if they are to serve their public and their undertakings as they should. At Neath, we have tried to give this service, though we feel that our efforts are still far from being perfect or ideal.

Tackling the Problem at Neath.

In 1920 we set about tackling the question in earnest, the principal points in our mind being:

(1) A maintenance scheme which would work successfully.
(2) Showrooms that would be of service to consumers.
(3) General standardization of gas burners, mantles, and fittings, as far as practicable.
(4) The stocking of only such gas apparatus as we had tested and found efficient.
(5) The education of the public by publications, gas demonstrations, &c.

We were unfortunate in that we could only get a very small shop for our showrooms; but we took this rather than nothing, and in our own way tried to make the best of it. It has served us well, but we are not satisfied, and have now got the promise of the Corporation to build us a much larger and modern showroom in the near future.

The maintenance scheme we devised is unique in one way, inasmuch as, after we had tried out the usual method of employing male inspectors, we dropped this, and substituted in their place lady inspectors. This has proved a step in the right direction, as we find that these lady inspectors can gain access to consumers' houses at any time of the day, and, generally speaking, they can get on much better with the lady of the house, being, as they are, neater in their person, tidier in their work, and much quieter in moving about their work in the house. These lady inspectors are thoroughly trained before being sent out to the district. They undergo a term of training in the repair shops, where they are taught how to adjust, regulate, and repair all classes of cookers, gas fires, and burners. After this training, they are put out for a time with the senior lady inspector; and it is only when the senior reports that the junior is satisfactory in every respect that she is actually allowed to work on her own.

The consumers, both ordinary and slot, are entered-up on cards, on which a record is made of the whole of the gas apparatus installed. A number of these cards are issued to each of the inspectors every day, and the work found necessary in the matter (say) of regulating the lights, cooker, or gas fires, is dealt with by the inspector during the visit. Anything special in the way of leakages or defects which require the services of a gasfitter is reported to the office on the following morning, and receives immediate attention. The inspectors take with them a supply of mantles and glassware, fixing these where required, and also serve the consumer by taking any special globe or shade which the consumer may desire to be fixed.

The inspectors are able to deal on an average with 35 consumers per day, and the whole of the district is covered in approximately six weeks. No charge is made for this service; the consumer paying only for the actual material replaced or purchased. Inspectors carry receipt books with them; and the whole of this work, except in the cases of special large consumers, is dealt with on a strictly cash basis. The inspectors are instructed to take note of any apparatus which appears to be defective or out of date; and these notes are followed-up by the district superintendent.

The cost of this particular service, after giving credit for profit on sales made by the inspectors, works out at rather less than ¾d. per 1000 c.ft. of gas sold.

The usual check is kept on these inspectors by special "follow-ups" made by the superintendent, and by letters from the office inquiring as to the satisfaction of the service to the consumer. The usual check is also made against the inspectors for material through stores.

This service has been greatly appreciated by the consumers, and has resulted in a greatly increased business. It has also practically eliminated the letters of complaint from the morning post bag.

Plumbers and Ironmongers.

As mentioned before, the showrooms at Neath are much too small; but it has to be remembered that this was an innovation, and that at the time only this small shop was available, and also that a considerable amount of opposition was put up by local plumbers and ironmongers, which had to be overcome in a tactful way, seeing that the Gas Department is a municipal concern.

In connection with this, it might be pointed out that an agreement was made with the plumbers and ironmongers that they could purchase from the showrooms at a special trade discount, which would enable them to do away with stocking gas apparatus themselves. This has worked remarkably well; the principal factors in our minds being, of course, that only first-class gas appliances, as stocked and recommended by us, are being sold in the district.

We then turned our attention to the question of gas burners generally, and after testing a number of types we decided to standardize two—one being what might be termed a fairly expensive burner, and the other a fairly cheap but, at the same time, thoroughly reliable burner. In connection with this, it might be mentioned that both these types have the same nozzle fitting, so that only one kind of spare nozzle is required. This, of course, makes the work of the lady inspectors much more simple, and is a boon to the stores department. This standardization has been strictly adhered to, with the exception that both these burners have been modernized.

The same method of standardization, as far as practicable, is being used with regard to fires, cookers, and other gas apparatus; the policy being to make extensive tests ourselves, and then to put into stock only such appliances as meet with our approval.

Educating the Public.

In the matter of educating our public, we have made special efforts in this direction by corresponding in a tactful manner on the advantages of gas, by large gas demonstrations (when we have shown rooms suitably fitted out, and have also run cookery lectures simultaneously), and by making use of our lady inspectors and other members of the staff in their contact with our consumers.

In addition we have taken advantage of demonstrations run by firms like the manufacturers of Birds custard powder, Green's sponge mixture, &c., to co-operate with a first-class show of gas apparatus, distribute literature, and get the lecturer to draw special attention to the benefits of gas in the home.

We are not pessimistic with regard to our lighting business; and while there are cases of shop premises where our rival competitor has been substituted, we have numerous instances of first-class lighting being carried out by gas, including outdoor shop lighting, which we run under a special hire maintenance scheme. In the field of domestic lighting, we have regained a number of consumers from our rival; and we never lose an opportunity of pushing our lighting business on every possible occasion. "Faint heart never won fair lady."

We believe in keeping our public lighting up to the very highest possible standard of efficiency, as we feel that this reflects credit upon ourselves, has a psychological effect on the mind of the public, to the advantage of our commodity, and is a standing education as to the brilliancy of gas lighting.

With our industrial load, though we are not in a position to retain the services of an industrial specialist, we do our utmost to see that this business is well looked after. To this end we regularly employ the services of an expert for a short time, to check our work.

We realize we have not covered the ground by a very long way, but we trust we may have stimulated afresh your interest in this most important branch of our work.

The time at my disposal in preparing this paper has been very short, and I apologize for any omission or repetition which may have occurred. It has simply been my wish to draw your attention once again to this highly important side of our business, and to inform you of what we have been trying to do at Neath, though possibly in an inadequate manner, towards fulfilling our ideals of "Service to Gas Consumers."

"B.C.G.A." DISTRICT CONFERENCE AT BUXTON.

MANCHESTER DISTRICT CONFERENCE.

There was an attendance of considerably over a hundred at a Manchester District Conference of the British Commercial Gas Association, which was held in the Town Hall, Buxton, on Friday, May 20, under the Presidency of Councillor A. J. POTTER, the Vice-Chairman of the Buxton Gas Committee—who took the chair in the unavoidable absence of the Chairman of the Committee (Alderman A. W. Wall, J.P.), who had intended to preside. A full programme had been drawn up; and the most complete arrangements for the comfort of the visitors had been made, with the cordial co-operation of the Gas Committee, by Mr. F. G. Shaw (the Gas Engineer) and his staff. In addition to the morning and afternoon sessions, and luncheon, many of the delegates found time to inspect, and consequently to admire, the magnificent modern showrooms of the Buxton Gas Department.

A cordial welcome was extended to the visitors by the Mayor of Buxton (Councillor William Goodwin, J.P.), who said he hoped that they would come again to the town on some future occasion.

PRESIDENT'S OPENING REMARKS.

The PRESIDENT (Councillor A. J. Potter): The privilege of presiding over this important conference rightly belongs to the Chairman of our Gas Committee, Alderman Wall; but in his absence (which I greatly regret), it is my pleasure to act as his deputy. His Worship the Mayor has fittingly welcomed you to this town of ours, of which I think you will agree we are justly proud; and in the name of the Chairman and members of our Gas Committee, I will venture to re-echo his words of cordial welcome. I have too much sense of what is fitting to presume in opening this conference to trespass for more than a moment or two on time which can be much more profitably employed than in listening to a layman revealing his ignorance; but, speaking as an interested outsider associated with local gas management, I am looking forward to to-day's discussion as a means of personal enlightenment. I trust the proceedings may prove of equal interest and profit to you, who spend your lives in developing the technique, and administering the services, of the gas industry.

REMARKABLE VITALITY OF GAS.

The first broad fact that appeals to me is that, for what in some quarters it is the fashion to refer to as a "declining factor," the great gas industry is revealing remarkable vitality. No feature of it is so remarkable as its continued expansion, and the increasing ratio of that expansion. I find, to quote Sir David Milne-Watson, that in 1902 the total output of gas in Great Britain was 160,000 million c.ft. Taking five yearly periods it rose as follows:

1912	181,000	million c.ft.
1917	232,000	,, ,,
1922	265,000	,, ,,
1925 (last available) . . .	284,000	,, ,,

No one can contemplate such figures without realizing that this great service to the public has only achieved such results by methods of research which have progressively multiplied uses of gas, both in domestic and industrial directions—particularly in the forms of heat and power. In this devising of new forms of application, the industry has bestowed on the community many benefits; among them being incalculable labour saving, increase of convenience, and cleanliness, in domestic economy, and in the more public sphere the elimination of smoke, the conservation of coal, and its more economic exploitation. These are a few of the facts which I think are by judicious propaganda being daily brought home to the public mind, and will make for a continuance of the remarkable expansion to which I have referred.

THE STIMULUS OF COMPETITION

I would like to say a word in deprecation of the somewhat hostile spirit in which the competitive element is being imported into the relations of gas and electricity in their bid for public favour. It is common to hear them spoken of as bitter rivals engaged in a life and death struggle which will mean the elimination of one. I think that they should be regarded less as rivals and more as sister industries; and that the energy now wasted in mutual recrimination should be applied to the making out of the directions in which these two great servants of mankind can best render service, each in its proper and definite sphere. To use a sporting phrase, "Let the best horse win." There is certainly no immediate prospect of "burial rites" being performed over the gas industry; and useless discussion as to relative merits, and futile waste of energy in acute competition, amounting to definite hostility, is a spending of power which could be more profitably employed in perfecting the service which each can give. We waste our time in throwing metaphorical bricks. On the other hand, a good-natured competition, in my view, is here, as in other industrial spheres, a distinct stimulus to effort. For example:

(*a*) It creates a constant urge to increasing efficiency.
(*b*) It demands a constant search for fresh avenues and methods of service.
(*c*) It tends to secure the elimination of obsolete practice.
(*d*) It makes imperative the service of publicity.

THE SALES SIDE.

I take it that your gathering to-day is another instance of your determination, as representatives of this great industry, to discuss and familiarize yourselves with the constant process of evolution towards perfection of technical method—the application of scientific research to manufacturing practice, and the incorporation with such practice of the latest results of chemical knowledge. But—and it is here that the instincts of an ordinary business man "sit up and take notice"—there is also the big question of the purely commercial side—the practical adaptation of apparatus to the daily needs of millions of homes, the devising and working of services, and the methods used to broadcast to the potential consumer by demonstration and modern publicity the many directions in which he may with advantage accept the facilities the industry offers. I would venture, as a business man, to suggest that your serious attention should be given to up-to-date methods of display, to sales management, and to the provision of showrooms that are in line with the modern demands of the public for pleasant surroundings and intelligent treatment, even in purchasing their daily requirements. The days of dingy cellars and of "any old hole and corner" for the sale of gas apparatus are over—and even the days of the salesman with dirty hands. That is a phase of the problem which we have tackled here with growing advantage to our turnover and satisfaction to our clients. I think it can be affirmed that you can, as a great public service, afford to stand four-square on achieved results. You can at least boast that you have asked for no subsidy, Government patronage, or public money. I trust such a confession of weakness will never be needed by the gas industry of this kingdom; and that, by the continued application of good British brains, this industry may continue to expand its usefulness in serving the needs of the community. [Applause.]

NATIONAL PUBLICITY.

Mr. F. W. GOODENOUGH, C.B.E. (Executive Chairman of the "B.C.G.A."): In the first place, I wish on your behalf to thank the Mayor most heartily for coming here and so cordially welcoming the conference to Buxton, and to thank the President of the conference for the excellent, broad-minded, and progressive address that he has just given us. It breathed the modern spirit of service in commerce in a way that must have been stimulating to all of you; and it will be an inspiration, not only to those engaged in the gas industry in this district, but to those who are so occupied throughout the country. I would also like to congratulate the Buxton Gas Committee on their most excellent showrooms. I have never seen better use made of showroom space, or a more attractive display, than I found in the new showrooms in the centre of Buxton. Mr. Shaw is to be congratulated upon having achieved a real triumph, and the Buxton Gas Committee upon possessing the business acumen to allow him to carry his scheme into effect. It is a showroom well worthy of the fine town in which it is situated. It is a great pleasure to be in so delightful a spot as Buxton; and it is also a great pleasure to be speaking to a conference of the Manchester District of the British Commercial Gas Association. I always associate the early success of the "B.C.G.A." with the Manchester district, because it was at a conference convened in the Salford Town Hall, presided over by our very good friend Alderman Phillips, that the Manchester district decided to support the then newly-formed organization on the full basis of subscription. I know that when the conference opened the Manchester district had decided that 1s. per million c.ft. was quite enough, and that when the conference closed they unanimously resolved to recommend the 2s. 6d. Naturally, therefore, I have, as Chairman of the Executive, cordial recollections of the first meeting I attended in the Manchester district. I also do not forget—for the district covers not only Lancashire, Cheshire, and North Derbyshire, but Yorkshire too—that the Doncaster Corporation was the first municipal undertaking to subscribe to the Association. We always regard the support of the Manchester district as one of the most important factors in the progressive success of the Association; and that is why I am here to-day to speak to you upon the work and policy of the Association.

THE ASSOCIATION NOT "LONDON RUN."

It may be asked: "Why do you think it necessary, after fifteen years, to come and talk about the work and policy of

the Association? Does it need any advocacy—any exposition—at the present time?" It is just because the Association has been in existence for fifteen years—a period during which there have necessarily been many changes among the Chairmen and members of Gas Committees, Chairmen and Directors of Gas Companies, and Gas Managers. It is because new generations arise that "know not Joseph" that it is well that occasionally we should all get together and consider fundamental principles—examine the basis upon which the Association stands and operates. Therefore I have come down from London to talk to you this morning. I purposely mention London, because I want to emphasize the point that the "B.C.G.A.," although its headquarters are in London, is in no sense a London organization. It is not London; it is England, Scotland, Wales, and Ireland, and the Empire as a whole, that the "B.C.G.A." represents, and for the country as a whole that it works. It is in no way "London run." It is no more London run because its offices are in Grosvenor Gardens and the Executive meets there than is the Government of the country because the Government offices are in Whitehall, the Cabinet meets in Downing Street, and Parliament sits in Westminster. The "B.C.G.A." is operated by an Executive Committee representing every district of the country, and by officers controlled by that Executive; and its whole outlook is British, and not that of merely London. After all, what is London? It is the temporary abiding place and successful hunting ground of the canny Scot, the cute Yorkshireman, the far-seeing Lancastrian, and the adventurous West Country man. London is full of progressive Provincials. Their feet are on its pavements, their hands are in its till; but their hearts are in their native hills. Were it not for the Provincials who come there to seek their fortune, London would be nothing at all. My point is that the "B.C.G.A." is the British Commercial Gas Association, and nothing else—nothing less.

Its Policy.

The policy of the Association is "For the industry;" and what is for the industry is for every undertaking that comprises the industry. The "B.C.G.A." stands for doing for the industry that which each one undertaking cannot as effectively or economically do for itself. That is the answer to the question: "Why send money to the Association to spend for the industry; why not spend it locally?" My further reply is that every undertaking ought—altogether apart from, and additionally to, its contribution to national publicity—to be spending every penny locally that it can effectively spend in making known the possibilities of its own service to its own community. It is the duty of every gas undertaking to advertise locally the possibilities of its service—to educate its own section of the public to the fullest extent. It is its duty to do this, because it is the only undertaking in the area it supplies which can render that particular service to that section of the community. If it does not make its service most fully known, if it does not most fully educate the public in its district, then its output will not be as great, and its price consequently will not be as low, as could and should be the case. That is why I say every undertaking that has a monopoly of its own particular service in an area has an obligation to make the possibilities of that service known to every member of the community in that area.

Local and national propaganda are not mutually exclusive. They are mutually helpful, and each is as necessary as the other. That undertaking profits most by national publicity which carries out most local publicity. And do not forget that the organization of the Association helps to make local publicity cheaper than it otherwise would be. It provides means for assisting the local manager to carry out his local publicity at a much lower cost and with far less trouble than he could otherwise do.

Another point to remember is that national publicity is different from local publicity. The particular aim of national publicity is to tell everyone in the nation—and therefore everyone in every locality—that the gas industry is a great national industry, full of life, vigour, and power to serve the nation as a whole as well as every household in it. The President has spoken very much to the point regarding the progressive character of the gas industry to-day; and that is what our national publicity seeks to make clear to all. National publicity is designed to make everyone in every undertaking's area realize that the local gas-works is not merely the gas-works in that particular town, but is a unit of a great whole—part of a vast, united, progressive organization for the service of the country. To bring that home to the mind of the nation is of very real value to each individual undertaking which forms part of this great whole. National publicity tells everyone that the growing use of gas means coal conservation, conservation of chemical wealth, and conservation of health and life. It means lightened labour, lengthened leisure, and lengthened lives. It means better cooking of food, healthier heating, and improved conditions, reduced costs, and increased production in industry. It is the primary aim of national publicity to impress these ideas upon the public, as only a national statement of the facts can impress them, and then to leave local publicity and local enterprise to bring the *ideas* thus continuously and convincingly put into people's minds to practical issue in increased business in gas appliances and in strengthened foundations of existing business.

National publicity tells everyone in every locality that gas is a great, growing, united, progressive, and essential industry; but the work of the Association is not merely directed to national advertising, but also to propaganda work in other directions—as, for example, teaching the teachers of the country, so that they may in their turn teach the younger generation all about gas as a national industry. We have met with great success in that direction; and I am sure you will all agree that nothing is more important to the future than that the children of to-day shall learn about gas naturally as part of their general education. Again, a great deal of work is done in the education—using the term in its broadest sense—of architects and the medical profession, and others who, like them, have the guiding of public opinion in every locality. All this can only be done—and much more could be done than has yet been accomplished, did funds permit—on the broad lines of national co-operative effort.

Co-ordinated Effort Essential.

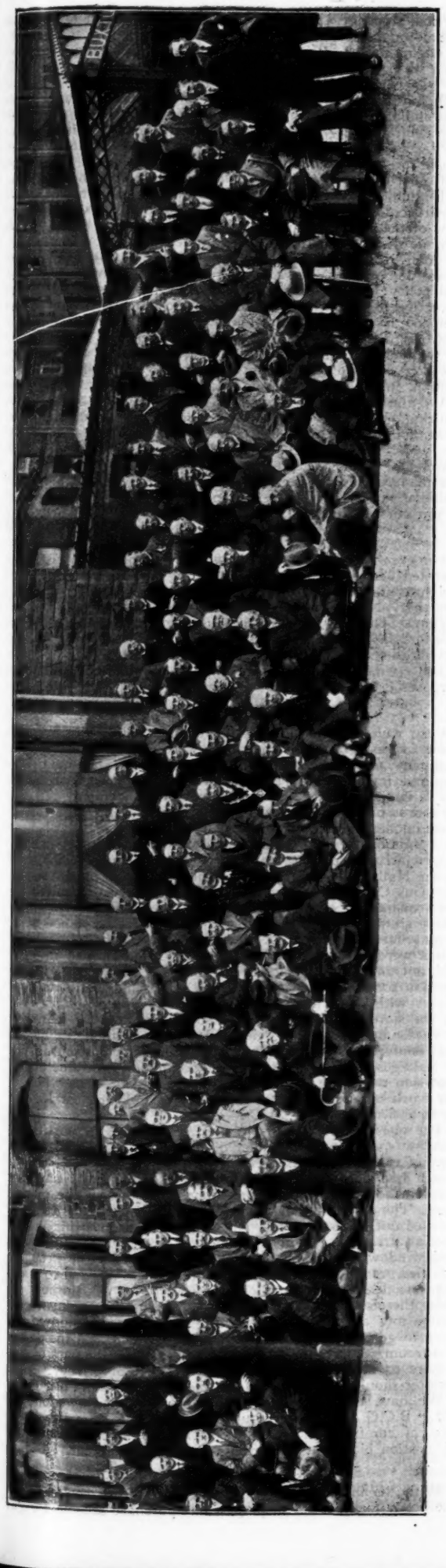
When I speak of national co-operative effort, I do not refer only to the "B.C.G.A.," but also to the other great organizations of the industry—to the great National Gas Council, which has done, and is doing, so much for the industry in many important directions, Parliamentary, legal, financial, and administrative; and to the Institution of Gas Engineers, which performs most valuable research work, and keeps the technical methods of the industry up to the highest possible pitch. The special task of the "B.C.G.A." is that of making known to the public all that the gas industry can do for it through all its organizations, as well as through its individual undertakings. This national work can be rendered much more effective by simultaneous, co-ordinated, continuous, local effort; and therefore I do ask you, not only to support national enterprise to the full, but to back it up locally by constant co-ordinated publicity work. More national, more district, and more local publicity is urgently necessary to-day. At the present time we are spending a ridiculously small amount of money on our national publicity—about one-tenth of 1 p.ct. on our turnover. There is practically no other modern business that does not spend ten times as much, and many spend twenty and even fifty times as much, as that in relation to their turnover. One big London stores spends more in one big London newspaper than the whole of the gas industry spends on the whole of the national newspapers and periodicals. Twice as much. Just think of that. And then we imagine we are doing a wonderful thing in spending what we are! It is a very usual thing for a commercial enterprise to spend anything from 2 to 5 p.ct. on its turnover on publicity. If you add what you do locally to what we do nationally, there are very few gas undertakings which spend 1 p.ct. of their turnover, or anything like it.

Electrical Development.

Now, as the President has said, we do not want to spend our money just in fighting electricity. But we have got to remember that the electrical development of the future is going to be at higher pressure than in the past. The electrical industry has got the favour of the Government, it has got the backing of national credit; and while I fully agree with the President that the two industries should be regarded largely as sister services, and recognize that each has a great field in which it is supreme, I am convinced that if we do not thoroughly look after and develop, do not fully till, and sow, and fertilize our own field, it will be invaded in growing measure by an industry that can only render service less efficiently in that field than we can, but which nevertheless can render it, and will render it if we do not. That is a very important point for us to bear in mind. Electrical competition and development will not necessarily be at the expense of the gas industry. As I say, each has its field. But the gas industry must till, sow, and water its own field, or others will come into it who have less right to be there from the point of view of efficient and economical service to the nation. We have to be efficient and effective to the utmost, if we are to do the service to the nation that we ought to do. Through the establishment of Salesmen's Circles, as well as the organization of national and district conferences, and by many other means, the "B.C.G.A." is seeking to play its part in raising the standard of that service throughout the industry.

Task of the Executive.

Naturally you ask from time to time whether the Executive Committee are spending wisely and well the money which you give them to spend. I can assure you that the task of spending that money is carried out with very great care and attention on the part of the Executive. If you could all have been present at the Executive meeting a day or two ago, when the accounts for the past year were gone through, and could have heard the cross-examination of your Executive Chairman by the immediate Past-President, Mr. Cowen (one of the ablest business men that ever sat in the chair of a Gas Company or presided over any other commercial undertaking), you would



MANCHESTER DISTRICT "B.C.G.A." CONFERENCE AT BUXTON.

have been satisfied that the accounts were not passed without very careful scrutiny. It is extremely gratifying to the officers and to the Chairman of the Executive that, after the most thorough examination, the accounts are unanimously passed for presentation to the General Committee, and by the General Committee to the members at the annual meeting. But we cannot make a penny go further than it will; and please do not forget that a penny does not go much farther nowadays than a halfpenny did before the war, and that the subscription to the "B.C.G.A." has not risen by any means proportionately to the rise in the cost of publicity. And when you are asked, as shortly you will be asked, to subscribe to the national organizations in the future on a rather higher basis than you have been asked to do in the past—though not a higher basis than that on which some undertakings have subscribed in the past year—do not forget that even then you will not be subscribing, proportionately to increased costs, at a higher rate than you did before the war. It is quite heart-breaking really up at "B.C.G.A." headquarters to have continually to be turning down on behalf of the gas industry publicity propositions which we know would be very profitable and advantageous to the industry, but which we cannot entertain because there is not the necessary money available.

District Committees.

A point to which I desire to call attention is that if any district is not satisfied in any particular with the publications in which our national advertisements appear, or with the line that is taken in our publicity work, the Executive Committee shall be always most glad to have suggestions and constructive criticisms from the members representing the district on the General Committee. All they ask is that any criticism that anyone conceives should be forwarded to headquarters, and not be nursed-up locally. We do not want you to hesitate to shoot at the man at the piano, merely because he is doing his best. We appreciate, and welcome, and seek, constructive criticism at all times. To facilitate among other things the expression of district and local views, we are proposing—and I am sure you will all be in thorough agreement with this—to revive the District Committees which functioned before the war. These Committees consisted of the representatives of the district on the General Committee. The officers will attend the meetings; and I hope I may be able sometimes to come with them to meet these Committees, and so find out exactly what the wishes of the districts are, and in what way we can—if we can—adjust our national publicity to their particular desires. You must have an Executive; and your work must be done by it on general principles. You cannot work any big organization effectively by a large committee, any more than you can work a company by shareholders' meetings; but you can direct policy, you can lay-down principles, in large committees, and that is what we have always endeavoured to do. We have always taken the feeling of the General Committee on any matters of policy; and we have invariably received from the General Committee the fullest confidence in the carrying out in detail of that policy, as to which we report regularly to them. That is the basis of our organization. The General Committee is a "Watching Committee," to consider and approve policy, and criticize its execution; but the Executive must execute, or be executed.

Importance of Unity.

Finally—though I have by no means covered all the ground of the Association's activities as I should have liked to do had time permitted—I would urge upon everyone the importance to the industry of unity. We cannot all agree on all details. We should not be capable business men if we did. But we can all agree to co-operate in the policy determined upon by the majority; and we do ask, not only for the whole-hearted support of all our national organizations by those who have hitherto supported them whole-heartedly, but for the full support of those who up to now have only partially subscribed, and of those who have not subscribed at all. No one in any of our organizations ever thinks of applying pressure upon either partial or non-subscribing undertakings—a steadily decreasing number, I am glad to say. If we cannot persuade, nothing else is worth while. It is persuasion, and not pressure, we of the "B.C.G.A." have always tried to apply in getting, as we have got, continually increasing support from the gas industry from the day we started fifteen years ago up to the present time. We know that no one will refuse to recommend his undertaking to subscribe once he is persuaded that it is for the good of his undertaking, as part of a great whole, that that undertaking should subscribe.

In conclusion, on behalf of the Executive, I want to thank all the members of the Manchester district for the great, and growing, and broad-minded support they have given to the work of the Association from its inception onwards, and to assure them that, so long as we get that support, it will be our pleasure, as well as our duty, to do the utmost we can for the gas undertakings in that and every other district. [Applause.]

Confidence and Thanks.

Sir Thomas Rowbotham (Chairman of the Stockport Corporation Gas Committee) moved a vote of confidence in the

"B.C.G.A." Executive Committee. The Association, he said, was a very necessary one. All they had heard that morning had been with regard to publicity; and he was certain from his own experience that a great deal still remained to be done in this respect. In Stockport they had been considerably exercised over this question of publicity; and as Chairman of the Gas Committee, he had made very determined efforts to "get a move on" in that direction. He thought there was some prospect of success. What they had already done had yielded excellent results. At first sight, it seemed rather strange that they should need to do so much advertising about a thing that must now be regarded as almost a necessity in every household; but they must do so, because people required educating in the matter of the extended use of gas. It was because the "B.C.G.A." were at the head of this movement, producing forms of advertisement and making suggestions which could be adopted locally, that they were all so greatly indebted to the Association. In Stockport the demand for gas had been increasing to such an enormous extent that they were thinking of putting-down further plant almost immediately; and this had been largely the result of advertising. The "B.C.G.A." were doing work which was conducive to national health and happiness.

Mr. John Wilkinson (Nottingham), President of the Institution of Gas Engineers, said he had been asked to second this vote of confidence; but he did not much care about doing so. He would like to ask: "Who has lost confidence; and why is it necessary that we should propose such a vote?" Some of them might have "groused" occasionally about the expenditure; but it was a Britisher's privilege to "grouse" now and again. Personally, he absolutely failed to see why they should be called upon to pass such a resolution. As had rightly been said, propaganda would be more necessary in the future than in the past. They were up against intensified competition from the sister industry; and what was the money they spent on propaganda, when compared with the amounts expended by other industries? It seemed to him that, although they might "grouse" occasionally, they had the utmost confidence in the work of the "B.C.G.A." If the Association held conferences in all parts of the country, and got everybody interested, then they would get all the money they wanted. Rather than a vote of confidence, the Association deserved a hearty vote of thanks.

The mover suggested that the resolution should be altered so as to embrace thanks for the past and confidence in the future; and in this form it was unanimously carried.

The President remarked that he hoped the Association would go on with the good work.

Mr. Goodenough said the Executive Committee did not think they had lost the confidence of those who had supported them; but he was very glad the resolution had been put on the agenda, because of the expressions of opinion it had evoked.

There was next a series of four short papers by Gas Engineers on topical subjects. The main points of these papers are given below, in the sequence in which they were presented.

BUXTON GAS SERVICE.

By F. G. Shaw, of Buxton.

The Borough of Buxton has no manufacturing industry within its boundaries with the exception of the gas-works and other public utility services owned by the Corporation. The area of the borough is 3108 acres, and approximately 90 p.ct. of the total gas sold is consumed within 1¼ miles from the gas-works. The present limit of gas supply is just inside 3 miles from the works. The estimated population of the borough is 17,000. In addition to the borough, two small out-districts containing 25 ordinary meter consumers and 182 prepayment meter consumers are supplied. The gas undertaking was acquired by the Local Authority in 1870 from the Buxton Gas and Coke Company, who commenced operations in 1851. New gas-works were completed on the present site in 1879; the old works being abandoned for gas purposes in 1880, when the make of gas was 26,747,600 c.ft. In 1907 the make of gas was 113½ million c.ft., and the capital employed £76,429. In the past year the make was 189 million c.ft., and the capital employed £91,291.

Price of Gas per 1000 C Ft.

—	Lighting.	Cooking and Heating.	Power.	Electric Department	Prepayment Meter, less Discount.
	s. d.	s. d.	s. d.	s. d.	s. d.
Pre-war	2 6	2 3	2 0	2 3	3 2
Present	3 6	3 -3	3 0	2 0	4 0½

A discount of 1½d. in the 1s. is allowed on the total year's collection from each prepayment meter, and paid in cash at Christmas each year. These prices were increased by 6d. per 1000 c.ft. for 4½ months in the last financial year, owing to the coal stoppage. Normal prices were restored on March 31. The borough electricity works use both town gas and Diesel oil engine power. In 1924 the whole electricity supply of the town was generated by gas, consuming 28½ million c.ft. out of the gas-works total make of 172 millions.

On my appointment as Engineer and Manager in 1911, the outstanding facts in connection with the undertaking were the loan debt of over £38,000, and the unsatisfactory position from the gas sales point of view. Changes in the social habits of the people for whom Buxton caters, the development of motoring, and other causes not easy to define, had arrested the progress of Buxton for some ten years. The works had been partly reconstructed and extended some eight years previously; and in view of the capital commitments and all the facts of the problem, it was decided that a programme of steady reduction of the loan debt, detail improvements in the plant as opportunity arose, and the building-up of a reserve for renewals was the best policy. The reserve fund, however, proved somewhat too attractive for the whole of the policy to be carried out—some £20,000 having been contributed to rate relief since 1911. However, the development of the undertaking has been carried on without much new capital being raised. The undertaking has now only an outstanding debt of £8370, and is, in my opinion, in an extremely sound position.

A feature of the gas-works is that the whole of the carbonizing, washing, and scrubbing, purifying, and auxiliary plant, boilers, &c., are situated in one building. Extensions of the works are now required. For the three years ended March 31, 1926, the present hand-operated horizontal plant has made 65 therms per ton of coal carbonized, together with a sale of 11½ cwt. of coke. A standard of 500 B.Th.U. appears to suit our conditions at present.

Gas Charges.

For over twenty years a difference of 3d. per 1000 c.ft. has operated between gas used for lighting and that for cooking and heating, per separate meter; and some fifteen years ago a further 3d. per 1000 c.ft. reduction was given for gas used for engines. This has operated well up to recent years, but is not now satisfactory. My own preference at present is for a rate of charge scaling as follows: "First 5000 c.ft., 3s. 6d.; next 15,000 c.ft., 3s. 3d.; all consumption above this, 3s. for all purposes except engines.

Gas Sales Development.

Very wide powers for manufacturing, selling, hiring, and fixing of gas-consuming appliances were conferred on the Gas Company, and later on the Local Authority. A showroom was acquired in the Town Hall buildings, and opened in 1914; and although it was in many respects inconvenient, yet progress was made until the war. After the war, the high cost of material and labour for some years prevented the equipment of a suitable service department. The undertaking had no proper accommodation for its fitting department; and the Town Hall offices were also required by other departments. The Gas Committee were agreed that what was required for our constantly expanding activities were central premises where showroom, offices, and workshops were combined, with a consequent saving of overhead expenses. The present premises were purchased and reconstructed and opened in 1925, and not only gave us accommodation for showroom, demonstration room, and offices, but also stores and workshops, together with three flats on the top floor. These are occupied by the storekeeper, a gasfitter, and a main and service layer, at reasonable rentals. Telephone communication, night and day, enables men to be turned out to urgent complaints, such as leakages, &c. Very early in the occupation the value of this provision was most convincingly demonstrated. The whole of the work of alteration was entrusted to me, and carried out by local firms.

The question of what is known as the open or partitioned window space has been under discussion. I have had experience of two showrooms previous to handling this one, both of which had partitioned window space; and I must say that I commenced planning for partitioned windows in the present case. The cost of the oak-panelled sectional partitions required worked out to about £128, and caused me to give this matter special attention. I finally decided to cut-out both stallboards and window partitions, to reduce the height of the proposed polished granite plinth under the windows to 9 in., and to maintain one floor-level throughout the showroom. Customers are able, therefore, to walk right into the window display to examine any article; whereas with a partitioned window they have to go outside, unless the display is duplicated inside the showroom. I have not found any hesitation on the part of customers to do business on account of lack of privacy. The counter should be well back from the windows, as in our case.

We have benefited considerably from advertising done by the "B.C.G.A." Good results have accrued from the insertion of carefully selected advertisements embodying suitable illustration blocks at appropriate periods of the year.

Success of the New Sales Policy.

With the introduction of new designs of gas cookers, and the better facilities for display, a hire-purchase scheme for gas

apparatus was introduced. This system has proved very successful; over 320 cookers having been sold for cash and on hire-purchase in two years, besides the placing out of an extra 180 on simple hire. We now have 1947 cookers out on simple hire. For two years, and continuing also this year, we have had cookery lectures, afternoon and evening, in our demonstration room, for a fortnight between Easter and Whitsuntide, and have found them most successful, both for new business and in popularizing the use of existing cookers—a most important point.

The number of gas fires in the district now approaches 3000, all sold outright. Business in hotel bedroom gas fires with coin meters is developing rapidly. We are selling outright about 260 gas fires and radiators a year.

I have had experience as Fuel Overseer here; and in 1920 the consumption of house and steam coal within the borough was 26,000 tons annually. In the year ended December, 1925, this figure was 24,000 tons, with a large hotel closed, the consumption of house and steam coal at which is estimated at 1500 tons annually. As 450 houses, most of them of a small type, have been added since 1920, equal to 2250 tons estimated consumption, it appears that the decline in five years in the consumption of house and steam coal in the borough may be estimated at 2750 tons, or 550 tons a year. There is, of course, some substitution of coke for coal; but this is no disadvantage to a Gas Department. Taking these figures with every caution, it appears to me that the use of gas is definitely arresting the consumption of coal for domestic purposes.

I believe it can be claimed that Buxton has a larger proportion of private houses heated on the low-pressure hot water system with coke-fired boilers than anywhere else in the country; and generally this central heating is supplemented by gas fires. In the smaller houses centrally heated, a great difficulty is the necessary attention to the coke firing of the boiler, where no manservant is employed; and we have one or two examples of central heating where gas-fired boilers have been substituted for coke-fired boilers. One gentleman, who was the pioneer of this system in Buxton, recently stated to me that if the cost of gas could be brought down to 2s. 6d. per 1000 c.ft., he would be more satisfied, and would advocate its adoption by his many friends. In time this appears likely to be realized, as the net profit for the year ended March 31, 1926, after providing for interest and sinking fund, was £5976.

We have made steady progress in increasing the number of domestic hot water gas-heated circulators in our district, the average consumption of which is closely estimated at 70,000 c.ft. per annum for each circulator. Gas geysers are also in use to a moderate extent; and the consumption of gas averages about 15,000 c.ft. per annum per geyser. The latter piece of apparatus is a source of great expense in installation, as if of reasonable size it generally necessitates a new service and a larger meter. Every water heating proposition has to be carefully considered, and much attention is given to examining all the circumstances of the case.

Inspection and Maintenance.

Commencing some six years ago a system of inspection, and within limits free maintenance, has been in operation; and our consumers appreciate this attention. The gas apparatus at the hotels, boarding houses, restaurants, and cafés is inspected and adjusted before each of the Bank Holidays in the year. One visit annually is paid to each private house ordinary meter consumer. The gas pressure is taken with various apparatus in use; and the cooker, water heater, gas lighting burners, and gas fires are cleaned and adjusted. One gas fire is fitted with new radiants free if required at the annual inspection; and more radiants needed being charged for. Mantles and globes, &c., supplied for lighting burners are charged for, or the consumers' own materials are used. The cost of one annual visit is 2s. 3d. per house. A first-class gas-fitter of good address is employed on this work; and he pays attention to instructing the consumers how to clean and adjust gas lighting burners and cooker and gas fire burners themselves. About 50 p.ct. of our ordinary meter consumers have gas lighting. Subsequent visits demonstrate that they are mostly able to maintain the apparatus at a reasonbly good standard between visits. A great improvement in the cleanliness of the apparatus is found.

I am satisfied that the reduction in complaints, thereby saving the work of a complaints fitter, meets the greater part of the cost of our system of inspection and maintenance, to say nothing of the defects put right where meters are found to be too small or not registering corectly.

LINKING-UP.

By Frank H. Robinson, Assoc.M.Inst.C.E., of Harrogate.

This question has been very much to the fore in connection with the Government electricity proposals. It ought also to be very much to the fore in connection with the gas industry, if gas is to be the domestic fuel of the future. There must be hundreds of villages in this country without a supply of gas at all, or, at the best, only an indifferent and expensive supply from a small country works. If we are to maintain the progress we have made during the last twenty years, and if gas is to be looked upon as *the* fuel for all domestic purposes and a host of manufacturing purposes, it is essential that the supply should everywhere be reliable—constant quality, composition, and pressure being necessary. Small undertakings have not, and cannot possibly have, the resources of larger and more efficient concerns. On top of this, the price charged is a distinct bar to extending the business in the heating field; for a high price means a restricted consumption. Who will use a gas fire to any extent when paying 6s. or 8s. per 1000 c.ft. for his gas? Small undertakings supplying gas at high prices, and unable to afford an efficient service to consumers, are doing real harm to the industry, and inviting competition.

In a small town near Harrogate, the gas supply was so poor, and the price so high, that a private individual commenced to supply electricity for lighting from his mill; and although charging 10d. a unit, he managed to get a good hold. Consumers were also going back to oil for lighting and cooking. The output of this works was under 3 millions a year. Shortly after, we took over the concern, and commenced overhauling the distribution system; and we were told that if we had been there twelve months earlier, electricity would never have been introduced.

What is the solution of this problem? I think the answer is to be found in the title of this paper "Linking-Up" with larger undertakings. I am indebted to two gentlemen who have recently dealt with the subject of linking-up for some of the ideas contained in this paper; but my remarks will be found to emphasize the points they made. Mr. Harald Nielsen dealt very fully with this from the technical point of view in an article appearing in the "Gas Journal" of Feb. 10 last year. The matter has since been under discussion at a meeting of the North British Association of Gas Managers, at Motherwell, on April 2, 1926, when Mr. W. E. Whyte read a paper on "The Question of Combining Gas Undertakings in Scotland," mentioning particularly the scheme for the Middle Ward of Lanark. In this, nine small undertakings were absorbed, and the manufacture concentrated at two works; high-pressure mains running out in various directions to feed the areas of the small undertakings absorbed. In one case these high-pressure mains extend 12 miles from the works, and in another over 7½ miles. In England and Wales there are similar schemes—such as the Grays and Tilbury and the Rhymney and Aber Valley. With high-pressure distribution, many outlying villages and small undertakings can be connected to larger concerns, and be given a supply of gas on reasonable terms, with good service, where none was available, or where the price was high and service poor.

By linking-up small with large undertakings, the manufacture can be concentrated at one place with a gain in efficiency, so reducing the cost of gas. A high-pressure main would be laid to the remote villages and townships, and the pressure reduced by district governors to the requirements of the district; or the gas may be introduced into existing gasholders for distribution through the ordinary system, with small governors from the high-pressure main where required, to assist weak spots. A district office could be opened with a small showroom attached, where orders could be received, accounts paid, and modern appliances displayed A separate office and showroom in each village is, of course, unnecessary; but there is usually some market town, among a group of villages, where a showroom could be opened for consumers from these villages to see up-to-date appliances, &c., on their weekly visit to market, subject to there being a sufficient population in the district to justify the expenditure.

There is another point which should not be overlooked, and that is the strong tendency to-day for business people from the larger towns to live in the country. They have been accustomed to the amenities to be found in the cities and larger towns; and it is up to the gas industry to see that one of these amenities—an efficient gas supply—is obtained in the country. High-pressure distribution, followed by good service, makes this possible. Gas supply is as much a public service as water and electricity.

Local prejudice often stands in the way of amalgamation. Small local authorities will decline to part with their undertakings to larger or more progressive concerns, from some local pride—so failing to realize the benefits which might accrue to their districts by such amalgamations. Their own gas has to be sold at such high prices as are necessary to make the concerns pay their way, whereas larger neighbouring concerns could supply cheaper gas more efficiently. In such cases, the elected representatives of the public are preventing the public they represent receiving a cheaper supply of gas. They are also standing in the way of development. Their own supply is too dear for much to be done in increasing business; and they will not allow anyone else to come in. Truly, a "dog-in-the-manger" policy. In the meantime, competitors come along and take the business.

Examples from Harrogate.

To illustrate the advantages to the rural districts by this linking-up, I will give two illustrations from the experiences of the Harrogate Gas Company.

In 1910, a small private gas-works at Birstwith was taken over. This village is 5 miles from our works, with another

village—Hampsthwaite—in between. When we took the works over, the price of gas was 5s. per 1000 c.ft., compared with 2s. 5d. in Harrogate; and the average consumption per meter was 12,000 c.ft. per annum. A special main was laid, and the works closed. Consumers signed an agreement to pay interest on the main according to a scale. With a consumption of under 2,600,000 c.ft. per annum, the extra price over Harrogate was 10d. per 1000 c.ft. This figure was to be reduced until, at 4½ million c.ft., the price became the same as in Harrogate. At the commencement, the consumers obtained a reduction from 5s. to 3s. 3d. per 1000 c.ft. In 1925 they passed the 4½ million mark; and they are now being charged the same price as in Harrogate. The average consumption per meter is over 25,000 c.ft. per annum; and the total number of consumers in the two villages is 221. The facilities and good service offered by the Harrogate Gas Company have received their reward from the consumers. Could a small undertaking with an output of 5 millions a year have achieved such results?

Last year we took over the Pateley Bridge Gas-Works, higher up the same valley. In 1923, the sales of gas in that district had fallen to 2,236,100 c.ft., and there were 256 consumers on the books—an average consumption of 8800 c.ft. per meter—and the price was 6s. 8d. per 1000 c.ft. net. Six months before we took the concern over, a fitter and service layers were sent out to overhaul the distribution system. On taking over, we sent out more fitters, supplied fittings, grillers, cookers, &c., on the slot system, and reduced the price 8d. per 1000 c.ft. immediately. The consumption grew rapidly; and in the last six months of the year, in spite of the handicap of a high price, the consumption was 2,434,400 c.ft. more than a year's consumption previously, and there were 374 consumers on the books. The connecting main between Harrogate and Pateley Bridge was completed, and gas turned on from Harrogate at the end of May last year. The consumption is now approximately 12 millions a year from this district, and averages over 16,000 c.ft. a meter; 75 p.ct. of the meters being prepayment. Six intervening villages now have an efficient supply of gas, where none was available previously. The extreme point at present supplied is 15¾ miles from the Harrogate Gas-Works. Altogether there are eleven villages and townships up the Nidd Valley supplied by gas on terms which no small undertaking could possibly give, and backed-up by a staff of experienced gasfitters who can deal with any problem of supply which is likely to come along.

As a further development of this policy of linking-up smaller with larger concerns, my Company has agreed to take over five other gas-works in the neighbourhood—Knaresborough, Wetherby, Boston Spa, Tadcaster, and Boroughbridge—whose aggregate consumption is approximately 72 million c.ft. There are many adjacent parishes to be included in the new area to enable connecting mains to be laid; and there are also others at present without a gas supply available to which we propose to extend our mains. When completed, our gas area will measure 29 miles by 17 miles, with the Harrogate works in the centre, and will include 57 parishes outside the Borough of Harrogate. The whole of this district is rural in character. By supplying gas to it at a reasonable price, backed by good service and uniform quality and pressure—which we are able to do by high-pressure distribution—we claim that we shall be doing a greater service to the community than if we confined our attentions to the immediate neighbourhood, leaving the small undertakings to struggle on with their high prices and inefficient service, and also leaving many places without a supply of gas. The development of this area will bring to a large population the amenities of town life while living in the country. From the local authorities' point of view it is good, as the rateable value of the parishes will increase when people know they can have a country life with civilization. From a gas undertaking's point of view, there is business in it if handled in the right way.

I quite realize that some small works are too far from larger works to make a high-pressure long-distance supply an economic proposition; but there must be many more where it is so, and wherever it is possible the matter should be seriously considered, in the interests of the gas industry as a whole.

PROGRESSIVE MANAGEMENT.

By H. Davies, of Chesterfield.

We happen to be fortunate in having for our Committee and Council a progressive body of men, backed by a Chairman whose enthusiasm for gas is unbounded. We started 6¾ years ago to enlarge Chesterfield's gas distribution, and expended £73,500 net in this effort, in extending and providing a supply of gas which would comply with the conditions as to pressure laid down in the Gas Regulation Act. Our output of gas during this period went from 219 million to 431 million c.ft. Our next business was to put the works in such condition as would ensure the production of the gas demanded, and on an economical basis. We have already expended £35,500 on this; and to-day gas is being sold in Chesterfield at 8d. per therm for lighting, 7d. for heating and cooking, and 6d. to 5d. for industrial and power—all less 5 p.ct. discount.

Methods of Charge.

Here let me refer to our methods of charging for gas, which you will notice provide for differential prices and a discount of 5 p.ct. By this system, we are gradually reducing the necessity for two or more meters upon single premises. Each consumer taking gas for lighting and heating uses one meter, and pays for the first 3000 c.ft. registered each quarter at the lighting rate, and for the remainder at the lower heating rate. This does away with the rental charge for the extra meter on the heating supply, in addition to reducing inspection and maintenance costs, and is an indirect concession to the larger lighting consumer. The discount which is given on payment within a definite time (about one month after the rendering of the account) has been instrumental in doing away with collectors—all accounts being rendered by post, and paid over the counter.

The differential prices and discounts are applicable both to ordinary and slot consumers; and we make the discount to slot consumers serve as a savings bank for the hire charges of apparatus. You will appreciate the advantage of this, and also the benefit to be derived from handing a substantial sum in coppers back to the consumers on the occasion of each visit for collecting. Our industrial load is fostered by a sliding-scale of prices varying by ⅛d. per therm from 6d. to 5d. per therm, less 5 p.ct. discount, according to quantity. We have not many industries in the town where gas could be of service; but wherever the opportunity has presented itself, we have done good business.

Service Department.

I must mention our service department. In December, 1922, my Committee decided to purchase a site in the centre of the town for the erection of a gas showroom, and appointed an architect to prepare plans. In March, 1924, tenders were let for the work, which was not completed until June, 1925, owing to the difficulty of clearing the site. This erection, which cost £8000, including nearly £3000 for the site, embodies some of my ideals of a service department—limited, of necessity, by the size of the undertaking and the sum of money available for the purpose. Although the premises have only been in use since July 22, 1925, the value of apparatus disposed of to March 31, 1927, has been £19,722; and during this period the undertaking has added in entirely new business 1704 cookers, 1436 fires, 1016 washing coppers, 66 radiators and geysers, &c.

We rent on simple hire one type and size of gas cooker, at 2s. per quarter; and one type and size of gas washing copper, at 1s. per quarter. All other apparatus is disposed of on hire-purchase, credit, or cash terms. Our terms are economic, and our electrical friends in Chesterfield admit that we lead the way, as they have recently opened showrooms in the town, and are letting-out both cookers and fires on simple hire, the terms for which, to my mind, are certainly not economic. Such competition stirs gas undertakings to be progressive, which is to the good.

LOCAL PUBLICITY.

By H. E. Bloor, of York.

The first and indispensable publicity effort of every gas undertaking is so to order its relations with its consumers as to be "of good report." Gas at a price which is sensed by general opinion to be satisfactory, service entitled to favourable comment, a competent and happy staff with a reputation for courtesy and consideration—all these are of primary importance. Throughout the entire field of management, therefore, from large questions of policy down to the smallest contact with the meanest present or prospective consumer, every act is an essential part of "local publicity." Unless in 99 p.ct. of cases local mention of a gas undertaking evokes praise, it were better to correct this, before embarking on "publicity" in the generally accepted interpretation of the word.

Showrooms constitute the first step in publicity proper. They are of no use unless they suggest the idea of an up-to-date and flourishing concern. They should appeal to persons of refinement, without appalling the humble by their magnificence. Whatever their design, and wherever they are, they should always be clean. I suggest that showrooms should always be in the heart of the shopping district in each town, and in a place which would be first rate for a department store or a cinema. To put good showrooms in unused streets is only one degree more foolish than to put bad ones in the public eye. I have seen both errors committed in extreme degree.

Advertising.

Gas publicity in the sense of advertisements should always be conditioned by the idea that our industry is a public utility with a long future, and a long past. That past is sometimes an obstacle to business, for there is inevitably an enormous quantity of old worn-out or otherwise unsatisfactory gas piping and appliances in existence, and it is somewhat of a problem to get consumers' property brought up to modern standard. Suggestions of the progress made in design of gas appliances is especially good publicity, and might, I think, be more used with advantage. It is almost impossible to conceive how advertising in newspapers and other publications could be managed without the "B.C.G.A." source of illustrations and letterpress. These serve as a mine of suggestion and inspiration; and there are occasionally other sources from which excellent material can be obtained.

There is a remarkable diversity in the nature of the publicity

propositions put before one locally, as regards the effective period of advertising secured. Thus, the church and chapel calendar blotters now so popular will in many cases be in constant use for a whole year; while the bus and tram ticket is retained for a few minutes only. It is essential that the advertisement be at least equal in taste to the whole production. Small local printers are frequently persuaded that the matter provided must be set so as to fill the entire space taken; and I have noted that an effective advertisement can sometimes be obtained merely by insisting upon adequate margins.

Advertisements in publications likely to be read from cover to cover should always contain solid matter for thought. Smoke prevention and its importance to health, improvement in gas appliances, comfort in the home with economy, &c., provide suitable subjects; and the letterpress may be comparatively long. Advantage should always be taken of any specialized body of readers. Advertisements of momentary effectiveness should be short and contain something to catch the eye and stimulate interest; but however short the letterpress is, it should contain an idea. In general, an appeal to "Use Gas" is likely to carry us no further; while "The Cosy Home is an All-Gas Home," plants a definite suggestion which has at least some hope of persisting when the occasion on which it was received is forgotten. Picture advertisements should preferably tell their own story; but if there be any letterpress, it should be very definitely appropriate to the illustration, and be so designed that attention directed first to the picture will be carried naturally to the letterpress and *vice versa*.

I do not regard gas bills as good media for advertisement, and have ceased to use them for the purpose, substituting separate leaflets of seasonal or topical appeal. Even these I conceive fail of their purpose if too often used; and acting on this idea, I have discontinued the leaflets for two or three quarters. They will be resumed with the June accounts, with a talk on the usefulness of gas fires in summer and autumn; and this will be followed up in September, when the winter use of gas cookers will be discussed.

All members who have not done so should visit the "B.C.G.A." showrooms when in London, and thus keep in touch with all the latest productions of the Association. It is impossible to pay such a visit without receiving a stimulus to effort and having a greater appreciation of the help the "B.C.G.A." offers to gas undertakings in their local advertising.

DISCUSSION.

Alderman F. POLLARD (Oldham) said the conference had had a great deal of valuable material placed before it in these papers; and he agreed with very much that had been said. However efficient people might be in their own works, points were bound to arise which could only be dealt with by a national organization like the "B.C.G.A.;" and these were tackled in a very capable manner by that Association. Whether for the giving of advice or for the championing of the cause of gas, the "B.C.G.A." was vital to the industry.

ENCOURAGE COKE CONSUMPTION.

From one of the papers they had learned that in Buxton much was being done to encourage low-pressure hot water systems. The gas industry would certainly hold its own in years to come, provided it could sell gas cheaply; and this, of course, depended largely upon the quantity sold. In this connection, it had to be remembered that, the larger the make of gas, the more coke would there be available. With existing methods it was possible to assimilate a certain amount of coke; but if the quantity available was to be largely increased, it would be necessary to find new directions in which to utilize it. If they could not secure fresh customers for it, they would have left on their hands vast amounts of coke which would have to be disposed of at "cut" prices; and this would mean that the price of gas would have to go up. One thing with which he did not altogether agree was the fixing of differential prices not according to the quantity of gas consumed, but according to the purpose for which it was used. He favoured a sliding-scale based upon quantity used, and thought this should apply not only to factories, but to residences as well. It was found in Oldham that one private house would use three times the amount of another.

SHOWROOMS IN A SIDE STREET.

There was a reference to showrooms in one of the other papers read with which, also, he did not find himself entirely in agreement. They had had in Oldham for years past very extensive showrooms right in the centre of the town; and these showrooms had been thought to be perfection. Then one fine day a big multiple-shop firm came along and offered a price for these premises which it was felt could not be refused. Therefore the Gas Department gave them up, and opened fresh showrooms at the works, in a side street. Now, it might hardly be credited that these showrooms in a side street had, in their own particular case, proved much more popular than the other ones. Whatever the reason, the fact remained that they had had a tremendous lot of orders there—far greater in number than was the case at the old showrooms. Of late they had found themselves in the position of having to say to people: "If you want a gas cooker, we cannot fix it for ten weeks to come." This had been got over now; but they had been behind with their work for two years. It was necessary to advertise, of course; but he did think there was room for still further discrimination as to the journals used for the purpose.

Mr. RALPH HALKETT (Sheffield) said they all knew Mr. Shaw. He was a quiet and unassuming man; but his paper proved conclusively that he was very progressive, so far as the gas industry was concerned. He certainly thought Mr. Shaw was on the right lines with regard to differential prices. His maintenance scheme, also, was an asset; and the very low charge made of 2s. 3d. per consumer was a figure upon which he was to be congratulated.

LINKING-UP.

With regard to Mr. Robinson's paper, no doubt there was a great future for the gas industry on the lines sketched out. ["Hear, hear."] He (Mr. Halkett) had maintained this for a number of years past. As a matter of fact, at Sheffield he had a scheme which had been drawn up for five years. This would link-up a number of small undertakings, if terms could be come to. His Company took over two undertakings a couple of years ago. In one case they had been able to reduce the price of gas 1s. 4d. per 1000 c.ft. immediately; and within the first twelve months, on a 30 million works, they got 20 p.ct. increase in consumption. This showed that, if the public were offered proper service, at the right price, they were willing to take the gas. They got in before electricity; and up to the present there was no desire for a change. On a recent canvass, only 4 p.ct. of the consumers signified that they would be prepared to adopt electricity.

COKE OVEN GAS.

Another matter which it was necessary for them to keep in mind was coke oven gas. His Company had for some time past taken considerable quantities of this gas. The amount had been 5½ million c.ft. per day; and only a few months ago they entered into a contract to take a further 3½ millions—thus making a total of 9 million c.ft. a day. The Company had gained experience; and the new contract had been drawn up on very different lines from the one already in existence. Mr. Davies managed his works well, as was proved by the price at which gas was sold; and he was backed-up by a progressive Chairman. ["Hear, hear."] He (Mr. Halkett) was at the opening of the new showrooms at Chesterfield, and realized that they were a credit to all concerned. He could not agree that showrooms at the works were as good as if they were in the centre of the town. Up to about five years ago, the showrooms at Sheffield were at the head office, which was almost in the centre of the town, and one of the finest buildings in Sheffield. Yet he was not satisfied that they were doing all the business they could; and he did not rest content until they got right into the centre of the town. In three or four years they had secured 100 p.ct. increase in business there; and this showed him they had adopted the right course. ["Hear, hear."] He agreed with Mr. Bloor that they must keep to the front. His Company not only benefited from the work of the "B.C.G.A.," but they were themselves continually advertising in Sheffield as well. It paid to keep in close touch with their good friends the Press.

THE FULL SUBSCRIPTION.

In conclusion, Mr. Halkett appealed to all present to back-up the work of the "B.C.G.A." It was, he said, more imperative than ever, now that the electricity scheme had been brought forward, that they should keep gas in the forefront. His own Board had decided to subscribe the full amount of 6s. per million c.ft. to the Association.

The PRESIDENT said it would have been very helpful to them all to prolong this useful discussion; but time would not allow of it.

On the proposition of Mr. GOODENOUGH, Councillor Potter was heartily thanked for presiding.

LUNCHEON.

On the invitation of the Mayor and Corporation of Buxton, the delegates then adjourned to the Buxton Hydro Hotel for luncheon. The chair was taken by the Mayor (Councillor Goodwin), who submitted the Loyal Toast.

"THE GAS INDUSTRY."

Councillor POTTER, submitting the toast of "The Gas Industry," said that when they spoke of this particular industry, they were referring to one of the most important factors in the domestic and industrial life of the country. The toast was to have been responded to by Mr. Goodenough, who unfortunately had had to return to town for another engagement. They had had the pleasure of listening to Mr. Goodenough that morning, with great profit to themselves; and they would have liked him to remain with them all day. The Association of which he was the Executive Chairman existed for the co-ordinating of the individual company and municipally-owned undertakings of the country, and to shape out for them a policy which meant consistency of action. Those of them who heard what had been said that day would realize that the usefulness of the Association had been abundantly vindicated. But for gas, the Buxton Corporation might never have had the opportunity of meeting one of the finest officials who had ever served them. It was through the energy, courtesy, and desire to please of this official that the arrangements for the conference had been carried out with so much smoothness, and with pleasure, he thought, to each one present.

Alderman F. S. PHILLIPS (Chairman of the Salford Corporation Gas Committee), responding, said he had been associated with Mr. Goodenough from the commencement of the life of the "B.C.G.A." He had met him in committee, and in various places at different times; and he could not tell them in a few words how much he thought the gas industry was indebted to Mr. Goodenough. There was one debt they would not be able to pay, although they might recognize it, and that was the debt they owed to Mr. Goodenough, the Chairman of the Executive Committee of the "B.C.G.A." from its inception. They were all very happy and comfortable that day; but had it not been for the gas industry, would that have been the case. ["No."] The industry deserved, although it had never got, and probably never would get, adequate public recognition of the invaluable services rendered by it to the country. He had been for over forty years connected with the gas industry; and at the end of that period—in spite of all that has been said about electricity—he

found himself as convinced a gas man as at the beginning, or even more so. Gas was not going, it was coming. Of the services which gas was capable of rendering, and which it would render, they had at present no full conception. Instead of being content to go on as they had been going on, they were looking for improvements in utilization and new methods of spreading the knowledge of the commodity they had to offer; and they were finding them. In Salford, they were at the present time giving daily cookery demonstrations; and they found that the field for the expansion of their operations was such that their gas cookers were going out at double the rate they were twelve months ago. This was the result of showing people the advantages of gas, without waiting for them to come and inquire. And this was not only true of Salford, but it was true of the whole country. They might therefore go on with great confidence, believing that, whatever they were doing to-day, they could do more to-morrow, and still more next year. There was plenty of room for growth and development on intelligent lines. The visitors were very grateful for the warmth of their reception at Buxton.

"Buxton and Its Gas Undertaking."

Mr. John Wilkinson (Nottingham) submitted the toast of "Buxton and its Gas Undertaking." He referred to the abundant hospitality which had been extended to the visitors, and to the evidence they had had of the energy and ability of the Gas Engineer and of those who were responsible for the policy of the undertaking.

The Mayor, replying, said that one of the things on which they prided themselves in Buxton was that they were well equipped with essential services. The gas undertaking was a flourishing concern which on almost every occasion came to the relief of the rates. This was mainly due to the fact that they had a good Gas Manager in Mr. Shaw. No one would emphasize this fact more than the Chairman of the Gas Committee would have done, had he been present; and no one would emphasize it more than the Vice-Chairman. Mr. Shaw had a very nice way of doing things.

Mr. F. G. Shaw remarked that he was glad to have the opportunity of saying how extremely proud he was of the support the Gas Committee had always given him. One had to look at things not only from the gas engineer's point of view, but (if it was a municipal undertaking) from the point of view of the representatives of the public. The argument that convinced the gas engineer was not necessarily the argument that would convince his committee. It was therefore necessary to understand their policy, as well as one's own technical problems. He believed, in trying to do this, he had succeeded in retaining the confidence of his Committee. The large and representative gathering at that conference was a source of much gratification to Buxton.

ATMOSPHERIC POLLUTION.

A return was then made to the Town Hall, where the afternoon was spent in considering the important subject of "Atmospheric Pollution in Relation to Health."

In opening the proceedings, the President pointed out that the community had for some time past been paying penalties which the coming of the industrial age had inflicted upon them.

Dr. R. Veitch Clark (Medical Officer of Health to Manchester) then delivered an address, in the course of which he said there is no doubt whatever that the physical degeneration which characterizes large sections of the urbanized part of our population is due to the conditions which have developed in town life as a result of the unconsidered way in which towns have been built, from the points of view both of housing and of industrial and commercial occupation. The average density of population in Manchester as a whole is 35 to the acre. In the central part of the city the number of persons per acre is 76; and in the outer parts the density is 28 persons per acre. The total death rate in the central part is 16 per 1000; whereas in the outer parts it is 10·5 per 1000. The density figure of 76 persons per acre in the central area does not really express the actual density in these housing areas, inasmuch as a relatively large portion of this central part of the city is built upon for commercial and industrial purposes, and the actual housing density is consequently aggravated by that fact. If, again, one divides the outer districts of Manchester into north and north-east on the one hand, and south on the other, it is found that in the northern section the total death rate averages 11·8 per 1000, and in the southern 10 per 1000. To put it in another way, the total death rate in the central district is 52·4 p.ct. higher than in the outer districts; and in the northern outer parts it is 18 p.ct. higher than in the southern outer parts of the city. These statistics relate to the five years 1920 to 1924 inclusive. The causes of this condition of things are manifold—the principal ones being poverty, with all its attendant circumstances; ignorance of the proper rules of healthy living; and the influences of actually bad physical environment. Dr. Clark only considered one aspect of the third of these causes—*i.e.*, of environment. This aspect was the effect upon the welfare of the people produced by atmospheric pollution and the diminution of sunlight.

In his book "The Smokeless City" Mr. E. D. Simon has shown that a reasonable estimate of the increased cost of laundering in the city of Manchester due solely to dirt is £250,000 per annum. It is a matter of every-day experience that in industrial centres it is impossible to keep personally clean. Linen is soiled completely before it has been worn two hours. In Manchester, the foreign matters in the air have been carefully collected and measured; and prolonged series of observations show that 20,000 tons of foreign matter are deposited each year on the city. Of that deposit, 15,000 tons is in solid form and 5000 tons is dissolved in rain or other water in the atmosphere. Of the insoluble matter 9000 tons is incombustible ash, and 6000 tons consists of combustible material, such as soot, tar, &c. The tar which is thrown off into the atmosphere in the raw combustion of coal in the city amounts to 380 tons, or 76,000 gallons. This is equal to many times the amount of tar used in road making in the city of Manchester, and gives a very striking illustration of the gross waste of useful material going on in our present industrial processes. In the soluble deposit there is annually deposited 1300 tons, or 210,000 gallons, of concentrated sulphuric acid, ordinarily known as oil of vitriol. Comparing the relative deposit in Manchester and in a district immediately to the south of the city (which is, in point of fact, only about 6 miles away from the city's centre), it is seen that on the average Manchester receives more than six times the amount of such deposit.

The facts as regards the incidence of daylight are equally striking. On the average Manchester received in the year 1926 only 55 p.ct. of the light received in Timperley, at a spot not more than 6 miles south of the centre of the city. The natural climatic conditions of these two districts are identical; and the difference in the amount of daylight received is entirely due to the conditions set-up by industry and the aggregation of housing in the city. There can be no doubt whatever that the loss of daylight in industrial centres is entirely due to the pollution of the atmosphere by the discharge into it of the products of the incomplete combustion of coal.

Why, asked the lecturer, do we deliberately and knowingly persist in fouling the air we breathe, in shutting-off the rays of sunlight we so much desire, and in wasting our material resources by pouring into the atmosphere substances which are economically valuable, and which permanently injure the whole community in its physical and mental well-being? Countless individuals among us know—for more than a generation we have as a community known—that we should not do this for every possible reason, either economic or humane; and we still do it. Fortunately in the new housing schemes only one room in each house is supplied with a grate for the burning of coal; and there is a steady, though slow, application of gas, electricity, and other smokeless power in industrial and commercial undertakings. But this advance is extremely sluggish; and the toll of disease is still heavy upon the community. We talk of conserving our national resources; but as a nation we continue to forget that our only asset is the health and efficiency of the individual members of the community. Probably no single act could more improve the welfare of our people than the abolition of smoke; and any organization which assists materially in the realization of this aim is an integral factor of profound importance in the national advance towards health, vigour, and efficiency.

Discussion.

Alderman Dr. C. W. Buckley said there was a tendency to-day to regard sunshine as the "be-all and end-all" of man's existence—the one thing likely to make him happy and successful. But when they had done all and said all about sunshine, there was still something else to find out. In the northern part of the country they could not hope for as much sunshine as in the south, and would have to be content with the ultra-violet rays the presence of which was not always demonstrated by actual sunshine; but their efforts at smoke abatement would increase the value of the light they enjoyed. He was absolutely convinced that the smoky places were the least healthy.

Councillor Dr. W. Shipton (Chairman of the Buxton Health Committee) said that though Buxton was not an industrial area, they had smoky chimneys; but he was glad to see they were becoming fewer. In their large hospital, with 300 beds, the cooking was done by gas, and there was no smoke at all. At the Thermal Baths there was a big installation for heating, in which coke was used; and there was no nuisance. It was of vital importance that a town like Buxton should have a pure atmosphere.

Dr. T. Buxton Flint (Medical Officer of Health to Buxton) emphasized the evils of smoke.

Need for a Good Smokeless Solid Fuel.

Alderman T. Cook (Chairman of the Manchester Corporation Gas Committee) said the problem they had before them was that of removing the great veil of smoke that prevented the sunshine coming through to them. The remedy was smokeless fuel. There was a time when 11,000 or 12,000 c.ft of gas per ton was considerd to be satisfactory working; but now people wanted to extract 15,000, 16,000, and sometimes one heard even of 18,000 c.ft per ton of coal. Now, one could not take out of a ton of coal more than it contained; and until they provided the housewife with a good smokeless fuel in the form of coke, they would never persuade her to use coke, however cheap they might make that commodity. He would like also to remind them that, however good the gas fires might be—and he supposed they had over 46,000 of them out on hire in Manchester—they would never take the place in the minds of the people that the open fire occupied. They might say, as some engineers did, when writing to the "Gas Journal," that the grates of to-day were not designed for the purpose of consuming coke. It would take very little to fit them to do so; and if they made a good coke, and persuaded people to use it, they would do a great deal to vanquish the smoke fiend.

No Rate Relief.

Mr. A. Tulley (Earlstown) agreed that they should have more sunlight, and that the cause of the trouble was coal wrongly used.

The more general the use of gas became, the better it would be for all; and therefore he deprecated the policy of making the gas-works relieve the rates. ["Hear, hear."] Gas should be sold at the cheapest rate at which it could be produced. His own rates were relieved 2½d. last year from the gas undertaking.

Dr. PICKUP (Medical Officer of Health to Wombwell) said that during the coal strike last year they had the lowest death rate they had ever had in the largest urban district in South Yorkshire—a colliery district. They could get the ultra-violet rays whether or not the sun was shining; but they could not get them if a smoke pall was hanging over a town.

The PRESIDENT said that what was needed was the enlightenment of the public mind by every means which could bring home to it the fact that at present a most valuable commodity—coal—was being grossly misused.

AN ACKNOWLEDGMENT.

Mr. W. M. MASON (Manager of the "B.C.G.A.") remarked that it had been said frequently of the gas industry that there were too many meetings; but he was sure no one who had sat through the proceedings that day would claim that the conference had been superfluous. The one trouble had been that there had not been time adequately to discuss the admirable material that had been placed before them. They had had proof of the necessity, from the gas point of view and from the public health point of view, for educating public opinion; and this could be done, as the "B.C.G.A." were continually doing it, through the Press. "Use gas and let in the sunshine" was a good slogan. He proposed a vote of thanks to the Mayor and Corporation of Buxton, and to the Chairman and Vice-Chairman of the Gas Committee, for the splendid arrangements made for the conference, and to Mr. Shaw and his assistants for the vast amount of hard work they had put in to make the meeting the success that it undoubtedly had been.

The vote was carried with applause; and after taking tea, the delegates separated.

LAYING A STEEL MAIN.

[From the "Journal des Usines à Gaz."]

The Tours Undertaking of the Compagnie Générale du Gaz pour la France et l'Etranger has recently had experience of laying a high-pressure steel main; and an illustrated description of the work appeared in a recent issue of our contemporary. The main was 860 m. [938 yds.] long, and is required to deliver gas at a pressure of 100 to 120 mm. [4 to 5 in.] W.G., with the possibility of a future increase to 2 m. [79 in.] or more. The calculated pipe diameter was 200 mm. [8 in.]; and it was decided to use Mannesmann spigot and socket welded steel tube.

The use of steel tube allows working in big unit lengths; and the line of main may be plotted out in unequal sections according as wide straight avenues, winding roads, and the contents of the subsoil dictate. On the other hand, if one prefers to stick to traditional methods of laying short, rigid lengths, one can still carry out the process with the steel tubes; but it is surely better to employ new methods, and so reap the maximum advantage.

The use of these pipes, which stand-up so well to the strain imposed by heavy traffic, allows a reduction in the depth of laying; and the width of the trench itself may be reduced to the minimum, as will be explained, and recessing is unnecessary. In this particular case, two or three rows of "pavé" stones were carefully removed, and a trench opened not more than 40 to 45 cm. [16 to 18 in.] wide.

The elasticity of the tubes was made use of in the following procedure which was adopted for the actual laying. On each side of the trench a runway was formed by planks placed end to end; and the pipe lengths were supported on empty metal tar drums spanning the trench and easily rolled on the planks—an arrangement which greatly facilitated manipulation and lining-up. The welding of the joints was quickly effected, as the operator had complete access to the work; and as soon as he had passed on, a preliminary test of the last joint was undertaken. The lowering of the pipeline into the trench was effected by merely rolling the drums along in succession, which explains why the trench was cut narrow and of even width throughout; there being no necessity for the workmen to get down for any purpose. The same procedure was observed in negotiating curves, except that the pipe had to be eased into the trench with a certain amount of leverage. The pipeline was kept under test pressure during the process of lowering; and this was regarded as an excellent additional trial of the quality of the welded joints.

The authors point out that during lowering the pipe may be regarded as a beam carrying only its own weight, and resting on perfect supports, one higher than the other, at its extremities. A calculation shows that in the case of the unsupported length being 46 m. [50 yds.], the maximum bending moment at the point where the pipe leaves the ground at trench bottom is 19·15 kg.m. [138 ft. lbs.], and that the upper point of a joint as it passes a drum is subjected to a tension of about 5 kg. per sq. mm. [over 3 tons per sq. in.]. The method of laying is thus considered as supplying an excellent test of the quality of the welder's work.

"W.D." Verticals for Fulham.—The Gas Light and Coke Company have, we learn, placed an order with the Woodall-Duckham Vertical Retort and Oven Construction Company (1920), Ltd., for an installation of continuous vertical retorts capable of making approximately 10 million c.ft. of gas per day, under ordinary working conditions, when carbonizing unscreened Durham coals. The installation is to be erected within an existing retort house at the Fulham Works, and will comprise two benches, each of thirty-six 103-in. retorts. The contract includes coal and coke handling machinery and four waste-heat boilers, three of which will normally be working, leaving the fourth acting as a standby. The order was placed after careful observation by representatives of the Gas Company of the working of the 103-in. retorts at Margate on unscreened Durham coal.

DESIGN OF HIGH-PRESSURE PLANT AND EQUIPMENT.

A Lecture at the Imperial College of Science and Technology.

A lecture upon the "Design of High-Pressure Plant," being the third of a series of eight lectures upon high-pressure gas research, was given at the Imperial College of Science and Technology on Friday, May 20, by Mr. D. M. Newitt, Ph.D.

In dealing with this subject, the lecturer described the various component parts of a typical high-pressure installation for studying gaseous explosions at initial pressures up to 100 atmospheres and explosion pressures up to 1000 atmospheres; and those attending the lecture had opportunity at its conclusion of examining a number of other types of apparatus in use in the high-pressure laboratories for investigating problems connected with catalytic reactions, solvent extractions, compressibilities, &c.

The particular unit described in the lecture included gas cylinders, pipe lines, junctions, valves, gauges, and a large cylindrical reaction vessel or bomb, of 2 litres capacity, designed for the purpose of obtaining spectrograms and photographic records of explosions of gas mixtures at high initial pressures. All parts of the system were capable of withstanding pressures up to 200 atmospheres and, in addition, the explosion vessel pressures up to 1000 atmospheres. The various items of equipment were described and discussed separately; and modifications necessary for working over a wider range of pressures were indicated. A summary was given of the reports of the Gas Cylinder Research Committee and of the nature of the tests to which gas cylinders have to be submitted in this country. Slides were shown of the results of bursting cylinders by hydraulic and by explosion pressures.

An important section of the lecture dealt with the various methods of making gas-tight and explosion-tight joints; such joints having to stand up to severe stresses caused by a combination of very high temperatures and pressures. Examples were shown of the metal-to-metal joints used in the long series of researches on gaseous explosions carried out during the past six years at the Imperial College, some of which have been made and broken many hundreds of times without their tightness being in any way impaired. Other parts of the system described included insulated plugs, junctions for pipes, and packings for high-pressure pistons.

In conclusion a number of examples were worked-out showing the method of calculating the stresses and strains set up in the walls of explosion vessels, gas cylinders, and screwed plugs.

The next lecture of the series will be given on Friday, May 27, in the Department of Chemical Technology, and will deal with the measurement of compressibilities.

Association Technique.

At a general meeting on April 6 of the Association Technique de l'Industrie du Gaz en France, which was recently constituted, as reported in the "JOURNAL" for March 2 last, a Committee of twenty-seven was balloted for, and immediately proceeded to elect the following officers: President—M. Auguste Baril, of the E.C.F.M. of Paris. Vice-Presidents—MM. O. Guillet, of Besançon; E. Chervet, of Lyon; and H. Laedlein, of the Société du Gaz de Paris. Secretaries—MM. L. Carpentier, of Paris, and L. Stoss, of Marseilles. Treasurer—M. D. Koechlin, of Paris. At a subsequent meeting of the Committee, it was formally resolved to associate with the Syndicat Professionel in constituting, as passed by law on Feb. 25 last, the Union Syndicale.

The British Industries Fair, 1928, will be held at Castle Bromwich from Feb. 20 to March 2.

STEAMING IN CONTINUOUS VERTICAL RETORTS—THEORY AND PRACTICE.

By NORTON H. HUMPHRYS.

(*Continued from p. 371.*)

II.—WASTE STEAM.

The accompanying tables afford little, if any, evidence in favour of waste steam (as indicated by the difference between the quantity admitted and that shown by the products as being actually decomposed) in the way of more active diluent or conserving actions, which by reducing the decomposition of methane and other permanently gaseous hydrocarbons will retain therms in the gas that otherwise might go to the tar well.

Such secondary actions are always attended with loss of calorific value so far as the gas is concerned, due to separation of carbon in solid form. Prevention is important if a high calorific value is to be maintained, but at present the general tendency is in the opposite direction. If the engineer is under the necessity of supplying a 450 B.Th.U. gas (actually a diluted 525), he looks with some complacency on secondary action.

As an illustration, take a retort having an entire vertical length of 25 ft., of which 5 ft. are occupied by a beehive-shaped enlargement at the base, surmounted by a column having even taper—say, from a horizontal area equal to 4 sq. ft. at the base to 2 sq. ft. at the top. These are empty or gross dimensions, which in working are occupied by the charge of coal, leaving only voids or interstices between the solid fragments which constitute net dimensions available for passage of the gases. Following the lines usually adopted when the stock of coal is to be estimated by cubing the bulk, the net horizontal area will be less than half that of the gross. A solid block of coal weighing exactly 1 ton, specific gravity 1·35, will occupy a bulk of 26·6 c.ft.; but as supplied to gas-works, the estimated bulk of 1 ton will be 42 to 45 c.ft. The net area or void space may be taken at 44 − 26 = 18 (say, 40 p.ct. of the gross). With the expansion of the spent charge and formation of larger lumps, there would be some increase. Evidently the net or void space is something less than 50 p.ct. of the empty or gross. With a moderate throughput of 2·75 tons of coal per 24 hours, and a make of 18,000 c.ft. per ton, the maximum speed of travel attained by the current of gas before leaving the coal would not be less than 2060 ft. per hour, as measured at atmospheric temperature and pressure. There are also vapours representing some 20 lbs. of tar and 16 lbs. of water, together with impurities that will be removed before the gas reaches the works meter; and the temperature of the whole will be near 300° Fahr. The maximum speed may be more like 3500 ft. per hour, and excess steam might bring it up to 4000. This will equal 60 to 70 ft. per minute; and a larger throughput—say, 4 tons per 24 hours—would increase it to near 100. The possibility of any advantage gained by relying on excess steam to increase that speed is not very obvious.

The steam will enter the retort at a temperature of 230° or thereabouts, and acquire some further increase by convection from the surroundings, and will leave at only a slightly increased outlet temperature. It does not rob the retort of sensible heat to any important extent. About 1120 B.Th.U. must be supplied for the generation of 1 lb. of steam, and is a direct charge on the fuel account, whether generated by means of a waste-heat boiler, or independently. In either case it takes up heat that could be usefully applied to other purposes. An excess of steam amounting to 10 p.ct. means a transfer of 2·5 therms per ton of coal from the fuel account to the condensing plant, where it is wasted and the inconvenience and expense of dealing with excessive quantities of water. An action between carbon monoxide and water vapour, expressed by the formula $CO + H_2O = CO_2 + H_2$ is known (see Butterfield, "Gas Manufacture," p. 121), and will be favoured if excess steam is present near the gas outlet end of the retort.

III.—SOME COMPARISONS.

Table I. is based on makes of gas as set forth in the Fuel Research Board Report, 1920-21, Section I., and in their Technical Paper No. 10, as obtained when stated quantities of steam are actually decomposed, which in some cases are much less than the admission into the retort. The columns headed (a) are copied from the reports; and those marked (b) comprise calculations based on the assumption that the whole of the steam admitted into the retort was converted into hydrogen and carbon monoxide; the other constituents remaining unaltered. It is a fiction that serves the present purpose, as referring to the steam only. If the whole of the hydrogen in the steam was obtained in free or uncombined condition, obviously none of it would be available for the formation of hydrocarbons; but the constituents of the coal are open to altered chemical and physical conditions brought about by various proportions of steam, and an excess offers no special advantages as compared with other gases. In practice, the complete decomposition illustrated in (b) may be attended with the increases in hydrocarbons shown in (a). Table I. demonstrates that the highest proportion of hydrocarbons is by no means consistent with the largest quantity of steam admitted.

The yields in terms of weight are calculated from the volumes, with the aid of data published in the "Gas Journal Directory," 1927, p. 86, and the assumption that the specific gravity of the hydrocarbons H_xC_x averages the same as that of air. With two exceptions, the total weights slightly exceed the calculations on the specific gravity, or set forth in the weight balances. The incombustibles increase in sympathy with the quantity of steam admitted; and as their specific gravity is more than double that of the combustibles, the fact is evidenced more strongly in the weights than in the measures. Comparing D with H, the increase is in ratio of 1 : $2\frac{2}{3}$; and the difference between B and 3 is about 1 : 2. Taken as a percentage on the totals, the volumes range from 9 to 13 and 10 to 11; but the weights, from 24 to 26 and from 27 to 30. The exact proportions are camouflaged by the steady increases in both volumes and weights of gases which follow advances in quantity of steam. The fairly regular increase in c.ft., from 13,100 in D to 25,610 in H; and from 12,000 in B to 19,210 in 3; from 38 lbs. in D to 89 in H; and from 389 in B to

TABLE I.

	Yields of Gas by Volume.									C.Ft. per Ton of Coal.						
	D	E		F		G		H		B	1		2		3	
	—	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	—	(a)	(b)	(a)	(b)	(a)	(b)
CO	969	1,857	3,388	3,109	5,649	4,019	7,221	5,058	8,478	1,206	1,884	3,620	2,826	4,539	3,275	5,833
H_2	6,812	8,158	9,230	10,180	11,487	11,651	13,064	12,690	14,320	5,964	7,399	8,377	8,786	9,597	9,646	10,591
H_4C	3,806	4,255	3,806	4,213	3,806	4,065	3,806	4,200	3,806	3,372	3,767	3,372	3,706	3,372	3,746	3,372
H_xC_x	288	353	288	341	288	406	288	384	288	264	324	264	302	264	317	264
Total combustibles	11,875	14,623	16,712	17,843	21,230	20,141	24,379	22,332	26,892	10,806	13,374	15,633	15,620	17,772	16,984	20,060
Incombustibles	1,225	1,807	1,225	2,217	1,225	2,439	1,225	3,278	1,225	1,194	1,696	1,194	2,040	1,194	2,226	1,194
Total	13,100	16,430	17,937	20,060	22,455	22,580	25,604	25,610	28,117	12,000	15,070	16,827	17,660	18,966	19,210	21,254
Calorific value per c.ft.	544	517	482	477	447	460	432	432	419	541	493	477	467	457	458	443
" " combustibles	600	574	521	536	475	515	453	491	440	602	566	513	537	488	527	479

	Yields of Gas by Weight.									Lbs. per Ton of Coal.						
CO	71	137	249	229	414	296	530	372	623	88	139	267	208	334	241	429
H_2	41	49	55	61	69	70	78	76	86	36	44	50	52	58	58	64
H_4C	159	177	158	175	158	169	158	174	158	140	157	140	154	140	156	140
H_xC_x	22	26	22	25	22	30	22	29	22	20	24	20	23	20	24	20
Total combustibles	293	389	484	490	663	565	788	651	889	284	366	477	437	552	479	653
Incombustibles	93	136	93	185	93	218	93	239	93	105	164	105	19	105	211	105
Total	386	525	577	675	756	773	881	890	982	389	528	582	627	657	690	758
Observed sp. gr.	0·370	0·410	..	0·428	..	0·442	..	0·446	..	..	0·442	..	0·450	..	0·471	..
Weight calculated therefrom	368	513	..	653	..	756	..	869	..	..	507	..	605	..	689	..
Weight reported	369	513	..	652	..	758	..	867	..	..	509	..	608	..	680	..

TABLE II.

—	Theory. P.Ct. Steam Decomposed.	Gain of Gas. C.Ft. (1) × 956.	Total Yield Gas. C.Ft.	Therms Gained. (2) × 3·02.	Total Therms. D + (5).	Gain. Lbs. H_2. 2·87 × (2).	Gain. Lbs. CO. 35·19 × (2)	No Gain of H_4C or H_xC_x.	Practice. Reported Make. C.Ft.	Reported Make C.Ft., *less* N_2.	Gain of Gas. C.Ft. (10) − D.	Total Therms. D + (13).	Therms Gained.	Gain, Lbs. H_2.	Gain, Lbs. CO.	H_4C.
D . . .	..	..	13,100	..	71·26	..	..	..	13,100	..	..	71·26	..	..	..	..
E . . .	5·06	4,837	17,937	15·28	86·54	14·5	17·7	..	16,430	16,009	2,909	84·90	13·64	7	65	19
F . . .	9·78	9,355	22,455	29·52	100·78	28·1	34·3	..	20,060	19,757	6,657	95·68	24·42	20	158	17
G . . .	13·08	12,504	25,604	39·50	110·76	37·5	46·0	..	22,580	22,211	9,211	103 80	32·54	28	224	11
H . . .	15·71	15,017	28,117	47·44	118·70 (B + 5)	45·0	54·7	..	25,610	24,187	11,087	110·80 B + (13).	39·54	36	300	16
Blank . .	..	..	12,000	..	65·00	..	..	..	12,000	..	..	65·00	..	..	..	..
1 . . .	5·05	4,827	16,827	15·25	80·25	14·5	17·7	..	15,070	14,658	2,658	74·29	9·29	7	47	17
2 . . .	7·60	6,966	18,966	22·95	87·95	20·2	26·6	..	17,660	17,295	5,295	82·47	17·47	15	120	14
3 . . .	9·68	9,254	21,254	29·20	94·20	27·8	34·1	..	19,210	19,085	7,095	87·98	22·98	22	153	16
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)

758 in 3, is remarkable. Or, taking combustibles only, which under the 1920 Act are the only part of the gas for which payment is received from the customers, the increase in lbs. from B to H is 293 to 651; and from B to 3, 284 to 653. The Yorkshire coal gives more hydrogen than the Welsh; and therefore the volume of gas is greater; but the thermal value is about the same. The actual quantities of incombustibles range from 1225 to 3278; and from 1194 to 2226. A marked practical disadvantage is that increase of steam is attended with an important decrease in calorific values, from 544 to 419 B.Th.U., and from 541 to 433. The diluent action of the incombustibles is instanced by the value of the combustibles alone, which exceeds the totals by a fairly even 55 to 60. For reasons above stated, the differences in columns (b) are of no consequence. The admission of steam may be limited by the declared calorific value, in absence of enriching arrangements. If the standard is 500 B.Th.U., and other conditions are similar to those under which the tests are conducted, second-rate coals must be left out of consideration, or the admission of steam restricted. There are only three tests that exceed the limit—viz., D, E, and B—and the Welsh coal will not give 500 B.Th.U. with 3 p.ct. of steam.

The reactions (b) take the lead in all respects, though with small quantities of steam the difference is not greater than might be accounted for by operation errors or losses. The respective thermal yields are set forth in Table II., columns 5, 6, and 12, 13. The divergence increases with larger quantities of steam, but at the worst does not exceed 9 p.ct. Such slight differences suggest that with other working conditions and descriptions of coal, an excess of steam is not necessarily a disadvantage, especially if the declared value is low. While increments under (a) include incombustibles, those stated under (b) cover combustibles only. To get a fair comparison as between (a) and (b), the incombustibles should be neglected. The calorific values in (a) are always in advance of those in (b), which is accounted for by increased production of hydrocarbons. Dilution, conservation, and altered chemical and physical conditions are probably all concerned in securing such results, which in some circumstances may be little inferior in value to the gain of hydrogen and carbon monoxide. Too much importance may be attached to the theoretical reaction, and not enough to the formation and conservation of hydrocarbons.

Table II. is a further exemplification of Table I., and of differences between theory and practice. Columns 2, and 9 to 12, are reproduced from the official reports. The steady increase in yield of therms in sympathy with the quantity of steam decomposed is shown in columns 6 and 12. There are remarkable differences between the yields of hydrogen and carbon monoxide, as stated in columns 7, 8; 2, 15, 16, respectively. The increases in hydrocarbons are erratic, bearing no relationship to percentages of steam. The highest yield of methane is obtained (E) with the lowest quantity of steam, and the best results in hydrocarbons (H_xC_x) are coincident with something less than 10 p.ct. Apparently excess of steam does not assist the production of hydrogen-carbon compounds, which frequently contribute as much as two-thirds of the entire calorific value obtainable from the gas. Taking that of hydrogen or carbon monoxide as unity, methane is 3·1, and the heavy hydrocarbons about 8.

Extracts from the reports issued by the Fuel Research Board have been freely incorporated in the tables, as affording reliable material for illustration of several items; but any direct or indirect attempt to criticize or to add anything to them is repudiated. Discussion is directed towards the working of continuous vertical retorts on the smallest practical scale in gasworks—say, not exceeding half-a-dozen retorts.

(To be concluded.)

THE INTERNAL COMBUSTION BOILER (BRUNLER FLAME).

By OSCAR BRUNLER.

[Abstract of a Paper read before the Society of Engineers.]

The author dealt with the internal combustion boiler and the various applications of flames submerged in water for industrial purposes. Dealing first with the principle of burning a gaseous fuel in water or other liquid, he said that any kind of fuel will burn in water, so long as the quantity of air or oxygen is large enough to support combustion. Considering the question of steam production for power purposes, he proceeded to point out that the efficiency of steam engine plants could be considerably improved by utilizing the steam-gas produced in internal combustion boilers. The net energy obtained per pound of residue oil burnt in water amounts to 1·9 H.P. hours; whereas the modern turbine locomotive produces 1 H.P. hour with the same quantity of fuel.

After discussing the question of power for the combustion air, the application of submerged flames for concentration purposes was alluded to. Submerged flames can be advantageously employed for the concentration of acids, waste liquors, and for the dehydration of sewage sludge. The last-named is a most important subject; and test figures for dehydrating sludge by means of submerged flames were given. For the dehydration of 1 ton of sludge from 98 to 60 p.ct. water content, 150 lbs. of residue oil were used, and 4700 lbs. of steam-gas were produced. Deducting the power used for the combustion air, a net power of 189 H.P. hours per ton of sludge is available for other purposes. The author advocated the dehydration of the sludge and its enrichment with nitrogen. In this case, the sludge would become a useful and valuable fertilizer, which could be sold with a considerable profit as agricultural manure.

MANUFACTURE OF NITRIC ACID BY SUBMERGED FLAMES.

The next point which was dealt with was the manufacture of nitric acid by means of submerged flames, which has been fully investigated on a commercial scale.

The combustion air is enriched so as to contain 45 to 50 p.ct. of oxygen. In consequence of the reduced quantity of nitrogen in the combustion air, the flame temperature is increased to over 2200° C. The rapid drop of temperature which takes place between the flame and the water produces nitric acid as well as nitrous vapours. The quantity of nitric acid depends on the pressure in the boiler. It has been found that the quantity increases with increasing boiler pressures. At 225 lbs. per sq. in. pressure, the output of nitric acid amounts to 25 p.ct. of the weight of the combustible mixture—*i.e.*, 1000 lbs. of fuel, *plus* enriched air, produce 250 lbs. of nitric acid.

Mr. Brunler then proceeded to deal with the interatomic theory and the question of internal combustion boiler efficiencies. An account of the constitution of matter, of the emanation of electrons and ions, and of ionic energy was given. The author said that nowhere else—not even in the disintegration of radium—was a dissolution so rapid, and that nowhere else did an emanation of electrons in such enormous quantities take place as in the hot gases of a flame. He also stated that the utilization of this radiant energy—*i.e.*, the interception of electrons, and their utilization—is possible. According to the law of the conservation of energy, the energy invested in the electrons cannot be annihilated. Mr. Brunler maintains that water, even in thin layers, stops the electrons in their travel; and the water becomes decomposed into its component parts—hydrogen and oxygen. These, being produced in direct contact with the flame, ignite and recombine.

The author concludes that the correct employment of flames burning in water is a means of making useful a source of energy little known up till now.

MIDLAND JUNIOR GAS ASSOCIATION.

The Annual General Meeting of the Midland Junior Gas Association was held at the Council House, Birmingham, on Thursday, May 19.

The annual report and statement of accounts were put before the meeting, and formally adopted.

Annual Report for 1926-27.

For some time past it has been felt that the Institution of Gas Engineers' Education Scheme, designed as it was to meet the needs of the juniors in our industry, was not achieving the success which all desired for it. Your Council has taken an active part in the discussions on this matter between the Institution's Advisory Board and the representatives of the Junior Associations. In order that the difficulties in the working of the Scheme might be more definitely appreciated, all members were asked to set down their personal opinions or particulars of difficulties experienced. The Advisory Board then called a joint conference between members of the Advisory Board, the Boards of Examiners, the existing District Committees of Advice, and delegates from all the Junior Associations in England, Wales, and Scotland. In order that a definite consensus of opinion might be obtained from the Junior Associations, a special meeting was called in Birmingham prior to this conference, when a statement was prepared for submission to the London conference. This conference took place on March 9; and, though the Advisory Board were not in accord with the Junior Associations' delegates on several of the points raised, the conference undoubtedly did much good in giving all concerned a better idea of the difficulties connected with the scheme. It is hoped that these deliberations will result in adjustments being made that will render it possible for an increased number of our members to take advantage of the Scheme during the coming session.

Twenty-three new members have been elected during the session now ended; membership to-day standing at 242, including 20 Honorary Members.

We regret to record the loss by death of one of our Honorary Members, Mr. S. R. Barrett, for many years Fittings Superintendent of the Birmingham Gas Department.

We think we may claim that the past session has been one of the most successful in the annals of our Association.

Mr. A. R. Myhill (Chemical Staff, City of Birmingham Gas Department) was unanimously elected Junior Vice-President for the coming session in place of Mr. F. Caudwell (Shrewsbury), who will become Senior Vice-President when Mr. H. R. Hems (Birmingham) takes the Chair.

In accordance with the rules of the Association, Mr. G. Burden and Mr. S. J. D. Williams retired from the Council; and Mr. F. Sylvester (West Bromwich) and Mr. B. Clark (Long Eaton) were elected in their stead.

The following officers were re-elected; a hearty vote of thanks being accorded for their services during the past session:

Mr. W. L. S. Spinks, Hon. Secretary.
Mr. G. W. Smith, Hon. Treasurer.
Mr. W. P. Timbrell, Hon. Auditor.

The President stated that in view of the large increase in the secretarial work, it would be necessary to appoint an Assistant Hon. Secretary; and Mr. H. C. Wills (Central Laboratory, Nechells Gas-Works, Birmingham) was duly elected to this office.

The President then referred to the Education Scheme, and said that he would like to take the opportunity of thanking Mr. W. J. Pickering, the Association's representative on the Advisory Committee, and Mr. R. G. Marsh, an active member of the Education Sub-Committee, for their excellent and painstaking work during the session. The Association was greatly indebted to them.

Mr. H. R. Hems, in seconding the vote, said that, as a member of the Sub-Committee appointed by the Council to take up the question of the Education Scheme, he could testify to the work done by these two gentlemen. The Association was particularly fortunate in having their services.

The President announced that the Council had unanimously decided to make Mr. P. N. Langford (Engineer and Manager of the Coventry Gas Department) an Honorary Member of the Association. Mr. Langford had been an active member of the Association since its inception.

INSPECTION OF GAS-CONSUMING APPLIANCES IN AN AMERICAN CITY.

Instructions for the Inspectors.

(*Concluded from p.* 237.)

The next section of the "Instructions" gives a description and a sketch of a typical gas-piping system for small dwellings. It is the case of a main supply, or "house riser," being run up the front of the house, with at each floor a line run back to supply the various rooms on the floor below. This typical system is more or less ordinary practice. Explanation is then given as to how to locate stoppages in the event of bad supply or poor lights by comparatively examining the latter at different levels to ascertain whether they are good or bad. The same instructions apply to the condition of the supply of different appliances. Concerning the adjustment of burners, their satisfactory performance, it is pointed out, depends on: (1) Sufficient gas pressure at the burners; (2) proper adjustment of air and gas supply; (3) freedom of burner from obstructions and broken or defective parts. Succeeding are instructions for the cleaning of lighting and heating burners, and the means to be taken to satisfy the inspector that the burners are, after these attentions, working properly. The inspectors are instructed that, if they find on the premises any range, water-heater, room-heater, or iron which they do not understand, or in which they fail to remedy a trouble, the matter is to be referred to the supervisor. If they are told by consumers of troubles with gas-engines, steam-boilers, or any special industrial appliance, they are only to investigate the question of the sufficiency of gas pressure, and then refer the case to the supervisor.

Flame Adjustments.

Regarding fuel appliances, if the flame is too "hard" the inspector is instructed to close the air-shutter until proper hardness is obtained; then if the flame is not high enough, he is to attempt to increase the gas supply by taking off the burner, unscrewing the orifice, and making sure the burner cock is not obstructed by pushing a large reamer, or other tool, all the way through the cock into the burner rail. It is also necessary to make sure that the orifice itself is not obstructed. On replacing the burner, an attempt is again to be made to adjust it. If the flame is still not high enough, the orifice should be removed and enlarged slightly; and this should be continued until a proper adjustment is obtained. On the other hand, if the flame is too "soft," the air-shutter should be opened until proper hardness is obtained. Then if the flame is too high, the orifice should be removed, and the opening be hammered up—*i.e.*, made smaller. Soft flames which are not high enough at the start are probably due to stoppage in the orifice or burner cock; and if so, these should be cleaned out before enlarging the orifice or moving the air-shutter.

Respecting the top burners of the cooker range, the inspectors are advised that the most efficient and the speediest cooking results are obtained by adjusting the burner flames so that the tips of the outside blue cone will just touch the bottom of the vessel above. Flames should be medium "hard"—*i.e.*, neither hard and stiff, nor yellow-tipped, soft, and flimsy. All adjustments should be made accordingly, unless the consumer specially requests that the flames be adjusted to suit his personal ideas, in which case the inspectors are permitted to comply with his request, provided no hazard is created.

The next section deals with burners under types of fuel appliances with closed tops, and then oven burners receive attention. It is explained that the proper flame for the oven burners is a cone slightly softer than required on top burners, and exactly ½ in. long. If the adjustment is made while the oven is cold, allowance should be made for the flame softening still further after burning for a short time. If the range has a flue connection without draught hood, an adjustment is to be made; but the consumer has to be informed that the absence of the hood will probably interfere with the efficient performance of the oven, as, where there is a strong draught, the heat of the oven will move so fast as to interfere with the baking results.

Concerning circulating water heaters, it is advised that the burner of ordinary form should be adjusted to medium hard flame, with blue inside cone about ⅝ in. long. Gas irons are also dealt with. Some of these are not provided with a movable air-shutter; and the gas supply only can be adjusted. This usually involves cleaning out the orifice, or enlarging it with a special tool. Some of the newer irons are equipped with adjustable air-shutter, enabling finer and quicker adjustments.

Home Economics Division.

The succeeding section of the "Instructions" deals with the nature of the services rendered by the Company's Home Economics Division. After a new range is installed, and whenever the Company, through its representatives, learns that the user of a range wishes instruction, a lady instructor from the Home Economics Division calls and explains to the consumer the proper way to obtain the best results. Should a consumer complain of poor oven results in a range equipped with an oven heat control, the inspector is asked not to attempt to take the regulator to pieces. But he is instructed to ask the consumer if she wishes to have a woman demonstrator to call to ascertain

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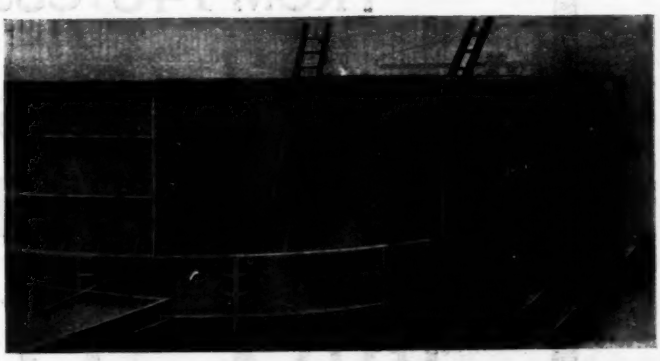

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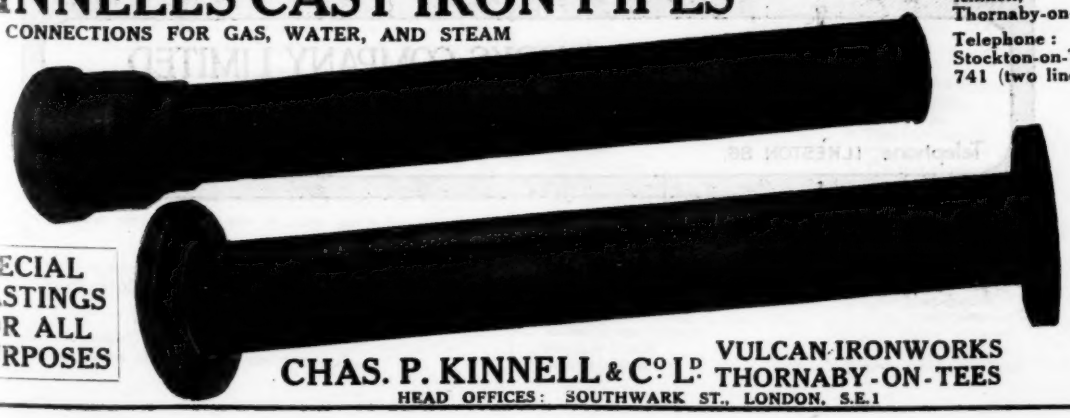

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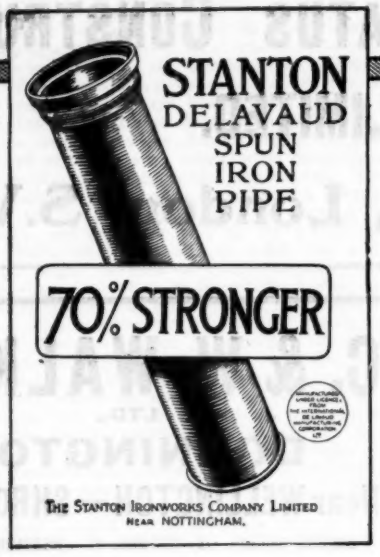

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the nature of the trouble. If so, then the fact is to be noted on the appropriate form.

APPLIANCES OF IMPROPER DESIGN.

It is pointed out that inspectors can help in preventing the sale and installation of improperly designed appliances by a thorough understanding of the principles involved in the correct combustion of gas. They are urged to be on the alert to recognize such conditions in an appliance as lead to unsatisfactory service, and to inform the consumer politely and fully regarding the cause of the trouble. It is suggested that there should never be outright condemnation of such an appliance, unless a dangerous condition exists, nor should any general remarks be made regarding any appliance, manufacturer, or line of goods. Observation should be directed to the particular appliance under inspection. It is especially emphasized that the inspector must not make any change in the design of an appliance sold by the Company, should he discover a defect, unless the work is of a character that is authorized. In the case of a defect in any appliance not sold by the Company, the inspector is permitted to make such changes as the supervisor instructs in each specific case, provided the consumer does not object.

METER ACCURACY TEST.

The next sections of the "Instructions" deal with such matters as leaks, location of leaks, care of meters, working on meter connections, examination of meters, and meter accuracy test. The last named is as follows:

Test of 3-lt., 5-lt., 5-A, 10-lt., 10-A, and 20-lt. Meters.—Examine carefully for by-pass installed by customer. If none is found, proceed as follows: Make sure no gas is being used, and ask consumer not to turn on any burner until you notify him that he may do so. Locate a convenient burner outlet, and place thereon a 6 c.ft. Bray burner. Turn fixture cock on full, light burner, making sure that burner is receiving full flow of gas, return to meter, paste a section of Form 636 around test hand circle, mark position of test hand on the form, and note the exact time by the second-hand of watch. After the time given in the table below has elapsed, again mark the position of the test-hand, count the number of points moved on Form 636, and enter this at once on your order, with the other required data.

Meter Size.	Proving Head. C.Ft.	Watch Test Hand. Minutes.	Movement of Test Hand. Required Points on Form 636
3	2	1	2
5	2	2	4
5-A	2	2	4
10	5	2	2
10-A	5	2	2
20	5	5	4

Before testing meters larger than 20-lt., consult supervisor. Do not use the Lucas-Blyler indicator or extra test-hand in making this test. If the movement equals or is greater than that required in the table, the meter has passed the test; if the movement is less than that required, the meter has failed to pass the test. If meter fails, order is changed for "Non-Register on One Burner."

If unable to use a Bray burner in the way previously described, and if a gas range is available, remove a large top burner, and connect the Bray burner with a rubber tube to the burner-cock. This method may be used on any other fuel appliance, or gas outlet, when the conditions are favourable.

If none of these methods is practical, or if any condition exists beyond the meter outlet which makes you doubtful of the accuracy of the result to be obtained from the burner method, you should shut off the gas, and make the test by placing a "test cap" on the meter outlet, watching the test-hand in the same way, and for the same time, as if the Bray burner were used.

If the meter is provided with a by-pass (installed by the Company), report case to your supervisor.

Test of 5-A to 30-A, and 30-lt. to 60-lt Meters.—Examine for by-pass as explained under "Test of 3-lt., 5-lt., 10-lt., and 20-lt. Meters," shut meter-cock, disconnect meter-outlet, turn on meter-cock, and allow gas to blow from the open outlet column for about four seconds. Then screw a "test cap" on the meter outlet screw, and complete the test in the way previously described for 3, 5, and 10-lt. meters.

WORK REPORT SPECIFICATIONS.

After dealing with automatic fuel appliances, the "Instructions" proceed to treat of work report specifications as follows:

General.—For every consumer visited, a record should be made on a separate Gas Supply Inspection Report (Form 205). No visits or reports should be made for houses in a court or alley in which there is no gas main. [Data on report follow.]

Whenever you gain admittance, all the spaces on the form must be filled in. When you make an examination of any portion of the system, and find it "O.K.," mark "Found O.K." in the proper space. When you do not make examination, or when no report is possible, a check mark should be made in each space to which the condition applies.

The entries to be made on the front of the order are described; and under "Work Still Needed," the following examples are given:

(*a*) If no work is needed, report "None."
(*b*) Consumer complains of high bill—not satisfied.
(*c*) Meter-shelf missing.
(*d*) Send Instructor from Home Economics Division.
(*e*) Pump out pipes.
(*f*) Replace meter-cock.
(*g*) Instal mantles, stove repair parts, &c.
(*h*) Riser tags missing.
(*i*) Works "catch" meter should be changed.
(*j*) Consumer wishes to purchase new water heater, &c.

LIMITS OF FREE AND CHARGE WORK.

The Company make no charge to the consumer for any work done on the meter itself or the piping between the street and the meter, unless the consumer or a mechanic other than a gas man is responsible for the breaking of the meter-cock.

The consumer will be charged for all work done between the meter and the burner except the following, which will be done free of charge:

Installing mantles belonging to consumer.
Adjusting lighting burners and fuel appliances.
Placing or replacing gauze in lights.
Repairing small gas leaks at lights, fixtures, cocks, and fuel appliances.
Removing stoppages from lights, fixtures, fuel appliances, and piping.
Replacing not more than three open flame burners for one consumer, provided existing burners cannot be made satisfactory.
Cementing gas range burners.
Replacing burner tips.

USE AND SALE OF MATERIAL.

For every open flame burner renewed free of charge, an old burner must be given to the supervisor. The articles carried in the stock-box have to be sold to the consumer at the prices specified, with no installation charge.

CONCLUDING INSTRUCTIONS.

Among the suggestions towards the end of the "Instructions" is one referring to tools and equipment. From this it appears that badges, tools, and other articles which are loaned to the inspector while doing this work are charged to his account; and he is expected to keep them in good condition, available for inventory and examination by the supervisor at all times, and to report promptly the loss of any article. The workman leaves the tools on the consumer's premises at his own risk; and he is charged for any article lost, stolen, or missing under any condition. No excuses are accepted for relieving him of this responsibility. The time spent in investigating troubles in the service, meter inlet connections, meters, house piping, fixtures, and appliances have to be charged to "Gas Supply Inspection." The time expended in repairing or remedying troubles in the meter-outlet connections, house piping, fixtures, and appliances are also charged to "Gas Supply Inspection," as is time spent in trying unsuccessfully to remedy or repair troubles in the service, meter-inlet connection, and meter. The time spent in remedying or repairing troubles in the latter fittings, providing on one consumer's system it is ten minutes or more, has to be charged to "Complaint Expense."

It is pointed out that if the rules and precautions described in the "Instructions" are faithfully followed, there should result from the work in a consumer's house no accidents to person or property, or annoyance to the consumer, due to the escape of gas while the inspector is on the premises, or after he has left. There are, however, many other possible sources of accident or damage to the worker or to consumer's property, which the former is exhorted to try to avoid by being careful at all times. It is pointed out that it is very important that, if an accident of any kind occurs, there should be no attempt to conceal it, because the worker thinks he has been careless, and will be reprimanded. A note should be made of the accident in his report, the consumer should be informed that it will be rectified, and notification should be made to the supervisor.

STANDARD TOOL EQUIPMENT.

Appended to the "Instructions" is the following statement regarding "Standard Tool Equipment for Gas Supply Inspectors:"

1 Leather tool bag.
1 Stove chisel.
1 Electric torch.
1 10 in. ½ rd. file.
1 Hammer.
1 Paint brush.
1 6 in. comb. pliers.
1 6 in. burner pliers.
1 ⅜ in. rubber plug.
1 Set of reamers, with orifice chuck.
1 No. 56 drill.
1 No. 3 screw driver.
1 6 in. screw driver.
1 10 in. trimo wrench.
1 14 in. trimo wrench.
1 Reflex crown wrench.
1 Reamer chuck.
1 Centre punch.
1 No. 5 hand drill.
1 Pair cutters.
1 Seal press.
1 Test cap (small).
1 6 in. burner and hose.
1 Tin box stove cement.
1 Tin box cock grease.
1 Can meter paint.
1 Can for soap.
1 ⅝ in. cap and plug, with white lead.
1 ⅜ in. cap and plug.
1 ½ in. cap and plug.
6 ½ in. fibre washers.
3 ¾ in. union washers.
12 5-lt. meter washers.
12 3-lt. meter washers.
4 10-lt. meter washers.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Glasgow Corporation Chemical Works Department.

Sir,—In reply to Mr. Tudsbery's letter in your last issue, I have to state as follows:

In my previous letter, I exposed the misstatement of fact made by Mr. Tudsbery anent the capital debt of the above undertaking; and those interested will have noted his evasion of this issue in his last letter.

My statement as to the net amount handed to the Gas Department averaging £245,606 per annum over the six complete years of the Department's existence is correct, and is not to be gainsaid by Mr. Tudsbery. Hard cash is not generally regarded as "meaningless" in this commercial world, although Mr. Tudsbery in this instance infers that it is so.

Mr. Tudsbery is satisfied with his viewpoint; but let me add just one little thing which may or may not disturb Mr. Tudsbery's equanimity. It is this: The very gas undertaking which he thinks shows results from tar and liquor in excess of ours recently applied to Glasgow for details with a view to establishing its own tar works. Surely rather a quaint commentary on Mr. Tudsbery's position!

J. Macleod, Manager.

Glasgow Corporation Chemical Works Department.

May 21, 1927.

REGISTER OF PATENTS.

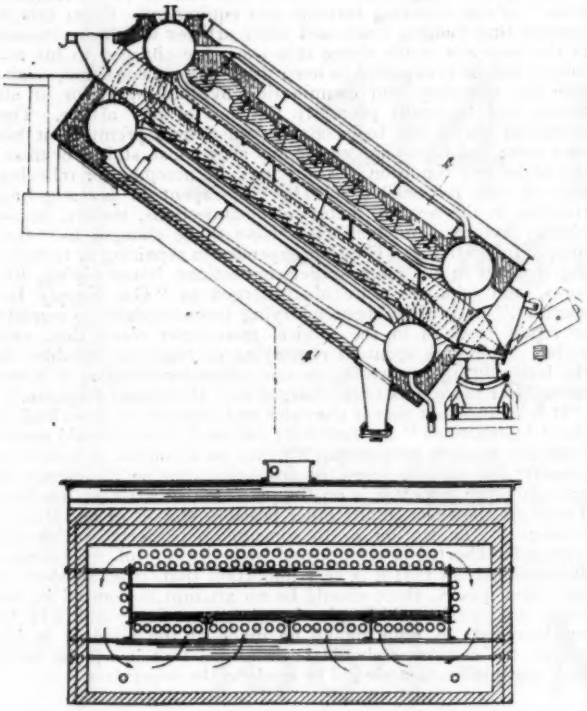
Coke Cooling.—No. 264,796.

Humphreys & Glasgow, Ltd., of Victoria Street, S.W. 1 (Assignees of W. T. Bosler, of Philadelphia).

No. 27,495; Nov. 2, 1926. Convention date: Jan. 20, 1926.

The principal objects of the present invention are to provide compact, efficient, and comparatively inexpensive apparatus for cooling coke without the application of water or moisture or the undue oxidation of the coke, and in which heat is recovered from the coke.

Generally stated, the invention may be said to consist in apparatus provided with a coke wharf or platform which is foraminous and is spaced from the top, bottom, and side internal surfaces of the casing containing it and the boiler element; this arrangement enabling gas currents to circulate through the coke on the platform over the sides thereof and down to the underside of the platform again.



Coke Cooling Apparatus.—Messrs. Humphreys & Glasgow.

The general design will be followed from the central sectional view and the cross-section on 4-4 which we reproduce. Feeding and discharging arrangements are provided, and the coke lies between the louvre-like plates and baffles carried by the side-plates of the framework. The boiler elements are indicated; and it will be seen that the tubes surround the wharf on all sides. The casing is refractory lined, and is provided with flues, clean-outs, &c.

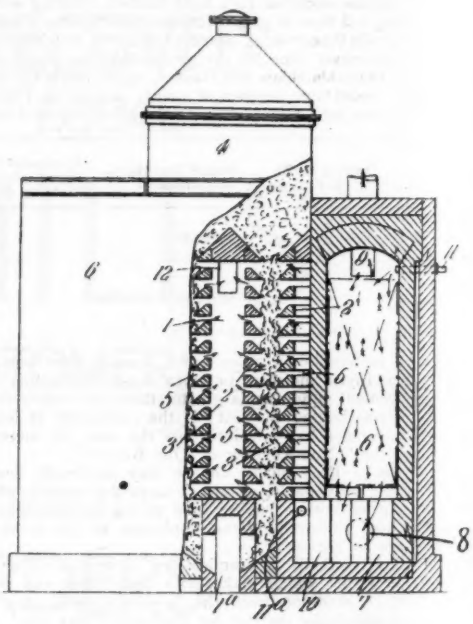
The patentees point out that heat convection currents may develop within the casing, as indicated by arrows in the cross-sectional drawing; but essentially the exchange of heat is effected by radiation and without the assistance of applied power or moving parts.

Manufacture of Water Gas.—No. 269,234.

Nielsen, H., of Muswell Hill, and Laing, B., of Hatfield.

No. 446; Jan. 6, 1926.

According to this invention the necessary volume of heat for carrying on the endothermic water gas reaction is provided by admitting to the producer, in addition to the steam, an inert and preferably combustible gas, such as hydrogen, coal gas, or the gas produced by the process itself, or else by employing a neutral gas admixed with carbon dioxide; the gas employed being at a temperature above that at which the reaction takes place, and preferably at a temperature of from 1000° to 1200° C., so that it provides the necessary volume of heat to compensate for the heat losses due to the endothermic reaction. The steam for the latter may also, if desired, be superheated to the same extent as, or to a less extent than, the inert gas or the combined neutral gas and carbon dioxide, so that the manufacture of water gas is carried on continuously, partly by reason of the sensible heat of the inert or neutral gas, and partly by the superheated steam.



Water Gas Plant.—Nielsen and Laing.

The apparatus claimed for carrying out the process is shown in the sectional elevation which we reproduce. 1 is a vertical reaction chamber containing two series of superimposed sloping shelves 2, 2; a vertical space 3 being left between each set of shelves. The space 3 is left to allow the semi-coke from the hopper 4 to pass from the top of the chamber 1 to the ashpit 1a. 5, 5 are horizontal channels between the superimposed shelves 2, 2 which allow the steam and the heated inert gas to come into intimate contact with the semi-coke during its downward movement. 6, 6 are chambers located on each side of the shelf chamber 1 for heating up to the requisite temperature the inert gas and also, if desired, the steam which is to be introduced into the shelf chamber. Each chamber 6 contains chequer brickwork; and at its lower end a combustion chamber 7 is provided. 8 is an inlet for the combustion gases, 9 is an outlet leading to a waste-heat boiler or a coal drier, and 10 is a passage leading from the chamber 6 to the shelf chamber 1. The inlet 8, outlet 9, and passage 10 are provided with valves.

The chamber 6 is first heated up by allowing the combustion gases to pass therethrough until the chequer brickwork is heated up to the desired temperature. On the chequer brickwork attaining the desired temperature, the valves in the passages 8 and 9 are closed, thereby cutting off the supply of combustion gases, and the valve in the passage 10 is opened. Thereafter the inert gas and also, if desired, the steam are admitted through an inlet 11. The inert gas and the steam pass through the chequer brickwork, and after being heated to the necessary reaction temperature enter the shelf chamber 1 through the passage 10; and water gas is manufactured by contact with the semi-coke in the shelf chamber 1, and passes off through the outlet 12. As the water gas is at a high temperature, it may pass into a retort where its sensible heat is employed to distil raw carbonaceous materials. Two chambers 6, 6 are provided in

order that the process may be carried on continuously. If the steam is not to be superheated, it may be admitted directly to the chamber 1, for example, at the point 11^a.

Other features and possibilities of the invention are explained in the specification.

Gas Burner for Coke Boilers.—No. 269,698.

HARRISON, A., of Walton-on-Thames, and SMITH, N. S., of Kensington.

No. 3236; Feb. 4, 1926.

The patentees make the following claim for this invention: A rotatable gas burner for lighting solid fuel fired stoves which is mounted at the side of the stove, and when in use is positioned horizontally in front of the bars of the stove which retain the solid fuel in position, and which can be rotated in a horizontal plane; said burner comprising an outer burner tube, drilled with burner holes, which is rotatable about the inner burner tube.

The burner has adequate provision for primary aeration of the flames, and is characterized by its flexibility and convenience. When not actually being used for igniting the coke, the burner offers no obstruction to the firedoor; and its construction is such that the burner outlets cannot become choked by dust or ashes. The efficiency is consequently constant. The main point, however, to which the patentees draw attention is that the angle at which the flames are directed into the body of the coke can be varied at will.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

Progress of Bills.

Commercial Gas Bill: Returned from the Commons, agreed to, with amendments, which were considered and approved.

Manchester Corporation Bill: Brought from the Commons, read the first time, and referred to the Examiners.

Matlocks Urban District Council Bill: Reported, with amendments.

Farnham Electricity Order: Approved.

Wallasey Corporation Bill: Reported from the Select Committee, with amendments.

Stoke-on-Trent Corporation (Gas) Bill: Read the third time, with the amendments, and passed; returned to the Commons.

HOUSE OF COMMONS.

Progress of Bills.

Commercial Gas and Manchester Corporation Bills: Read the third time, and passed.

South Staffordshire Mond Gas Bill: Read a second time, and committed.

Smethwick Corporation Bill: Reported, with amendments.

Special Orders.

The Special Orders Committee reported that no petition had been presented against the Southgate and District Gas Order and the Farnham Electricity Order, and that there was nothing in them to which it is necessary to call the attention of the House.

Fuel Research.

In reply to questions by Mr. Tinker, on May 17, the Duchess of ATHOLL gave the following information: The amount of coal treated at the Fuel Research Station, East Greenwich, during 1925 was 3314 tons. A considerable proportion of the products from the coal carbonized is used at the station. The value of the untreated gas and tar surplus to the requirements of the station and sold to the South Metropolitan Gas Company amounted to: Gas, £1249; and tar, £318. In addition, £250 was received from the sale of coke, the balance of gas and coke being used for other experimental work and power production.

The crude oil and spirit obtained from one ton of suitable coal treated by the Bergius method amounts to from 110 to 135 gallons. In addition, a further unknown amount of coal is necessary for power and hydrogen production. The highest yields of dry tar and spirit, observed by the Fuel Research staff, as obtained from the low-temperature carbonization of ordinary coal in a large-scale plant, is about 21 gallons; but the average bituminous coal will probably not yield more than about 15 gallons. Good quality cannel coal, of which there is only a limited supply, may yield 50 to 60 gallons.

Carbonization Statistics.

Colonel LANE FOX stated, in reply to Mr. Lunn, that in the year 1925 approximately 30,200,000 tons of coal were used for high-temperature, and 20,000 tons for low-temperature, carbonization.

CROYDON CORPORATION BILL.

This Bill, which was considered recently by a Committee of the House of Lords, contained proposals for the carrying-out of certain waterworks by the Croydon Corporation; and the Wandsworth, Wimbledon, and Epsom District Gas Company petitioned in order to secure protection against damage to their mains and apparatus which might result from the carrying-out of the waterworks by the Corporation. Before the Bill reached the Committee a protective clause was agreed upon, and the Gas Company's petition was withdrawn. The Committee, however, after their deliberations, deleted the waterworks proposals from the Bill; and the clause to protect the Gas Company, being now unnecessary, was also deleted.

GREENOCK BURGH EXTENSION BILL.

This Bill has been under consideration for some weeks by a Committee of the House of Commons (presided over by Lieut.-Col. Sir JOSEPH NALL, D.S.O.). Its proposals were to extend the Burgh of Greenock to include the existing Burghs of Port Glasgow and Gourock, and parts of the parishes of Inverkip, Port Glasgow and Kilmacolm, and to extend the Corporation's gas supply limits to include the areas added to the Burgh. It was also the intention of the promoters to amalgamate the gas undertakings at Port Glasgow and Gourock with the Greenock undertaking, and to concentrate the manufacture of gas at Greenock—at least for the greater part of each year. (See "JOURNAL" for April 20, p. 184.) There was a great deal of opposition to the proposals.

The Committee eventually decided, by a majority, that the preamble of the Bill in so far as it related to the annexation of the Burghs of Gourock and Port Glasgow, was not proved. The remainder of the proposed added area was considerably modified, and only a small portion of it was added to the Burgh.

MATLOCKS URBAN DISTRICT COUNCIL BILL.

The Unopposed Bills Committee of the House of Lords (presided over by the Earl of DONOUGHMORE, Lord Chairman of Committees) on Tuesday, May 17, ordered this Bill to be reported for third reading. The Bill contains a number of provisions relating to the gas undertaking of the Urban District Council, including provisions for changing over to the thermal basis of charging. Originally it provided also for the extension of the Council's gas supply limits, but this provision was deleted from the Bill before it reached the House of Commons. (See "JOURNAL" for Jan. 19, p. 145, and March 23, p. 753.)

SMETHWICK CORPORATION BILL.

The Unopposed Committee of the House of Commons (presided over by Mr. J. FITZALAN HOPE, Chairman of Ways and Means), on Thursday, May 19, ordered this Bill to be reported for third reading. Its main purpose is to extend the Borough boundaries and the Corporation's gas supply limits. There are a number of general clauses relating to the gas undertaking. (See "JOURNAL" for Jan. 26, p. 190.)

Mr. HERBERT GROVES (Messrs. Sherwood & Co., Parliamentary Agents) said it was originally intended to extend the Borough to include the whole of the urban district of Oldbury, but, as the result of negotiations with the authorities, it was now proposed to annex only part of the urban district.

The CHAIRMAN asked what was the object of the gas clauses.

Mr. GROVES said that it was simply to bring the Corporation's gas legislation up-to-date. They had not been to Parliament for many years, and the clauses in question were of common type, to which nobody objected.

The Corporation's gas limits would be extended to include the area added to the Borough, with the exception of part of that added area in which Birmingham were now supplying.

STOKE-ON-TRENT CORPORATION (GAS) BILL.

This Bill was ordered, by the Unopposed Committee of the House of Lords (presided over by the Lord Chairman of Committees, the Earl of DONOUGHMORE), on Tuesday, May 10, to be reported for third reading. Its principal object is to enable the Corporation to lay a main along a route passing through the urban district of Woolstanton United (which is not within the Corporation's gas supply limits), and to acquire the necessary lands and easements. The Corporation, in pursuance of their policy of amalgamating their various gas-works and concentrating manufacture, wish to connect up the Etruria and the Longport Works by means of the main in question, and to discontinue manufacture at the Longport Works. The Bill has passed the House of Commons (see "JOURNAL" for Jan. 26, p. 190, and March 30, p. 821).

WALLASEY CORPORATION BILL.

This Bill has been under consideration for some time by a Committee of the House of Lords (presided over by Viscount YOUNGER), who have now given their decision. The Bill proposed to extend the boundaries of the borough of Wallasey to include the township of Moreton and part of Bidston-cum-Ford, and similarly to extend the Corporation's gas supply limits. It was also provided that the Birkenhead Corporation and the Hoylake Urban District Council should sell to the Wallasey Corporation those portions of their gas undertakings situated within the added areas. (See "JOURNAL" for Jan. 26, p. 190.) The Committee found the preamble of the Bill proved, but modified the area in Bidston-cum-Ford to be added to the Borough.

MISCELLANEOUS NEWS.

BIRMINGHAM GAS PRICES.

At a meeting of the Birmingham Gas Committee on Monday—Alderman J. H. Lloyd presiding—it was decided to reduce the price of gas to the domestic consumer by 4d. per 1000 c.ft. This reduction, which restores the price to the pre-strike figure of 3s. 2d. per 1000 c.ft., will apply to gas consumed after the June reading of the meters. In May last year the price was advanced by 6d., and last November by 4d., the total rise of 10d. making the rate 4s. In March last the rate was reduced by 6d. Notwithstanding the heavy cost of the coal stoppage, the usual contribution of £41,200 to the borough fund (towards rate relief) will be made.

The following is a list of the new prices:

For Lighting, Cooking, and Domestic Purposes in One Premises.

	Per 1000 C.Ft. s. d.
Up to and including 100,000 c.ft. per quarter	3 2
Quantity in excess of—	
100,000 up to 500,000 " " "	3 1
500,000 up to 1,000,000 " " "	3 0
1,000,000 up to 2,000,000 " " "	2 10
2,000,000 up to 3,000,000 " " "	2 8
3,000,000 up to 4,000,000 " " "	2 5
4,000,000 " " "	2 2

For Manufacturing and Motive Power in One Premises

	Per 1000 C.Ft. s. d.
Up to and including 1,000,000 c.ft. per quarter . . .	2 8
Quantity in excess of—	
1,000,000 up to 2,000,000 " " " . . .	2 5
2,000,000 up to 3,000,000 " " " . . .	2 2
3,000,000 up to 4,000,000 " " " . . .	2 1
4,000,000 " " " . . .	1 11

The above prices are subject to 5 p.ct. discount for prompt payment.

Gas Supplied through Prepayment Meters.

—	Installations in Use Less than 10 Years. C.Ft. per Penny. From—	To—	Installations in Use 10 Years and Upwards. C.Ft. per Penny. From—	To—
With meter only	23¾	26	23¾	26
With meter and Corporation fittings .	22	24	23¾	26
With meter and Corporation cooker .	21½	23½	22	24
With meter, Corporation cooker, and fittings	20½	22½	22	24

CAPE TOWN AND DISTRICT GAS LIGHT AND COKE COMPANY, LTD.

The Thirty-Seventh Ordinary General Meeting of the Company was held last Wednesday, at the London Offices, No. 38, Grosvenor Gardens, S.W.—Mr. H. R. Savory (the Chairman) presiding.

The Secretary (Mr. R. W. Blackburn) read the notice convening the meeting and the Auditors' report; and the Directors' report and the statement of accounts for the year to Dec. 31 were taken as read.

The Chairman said that the year 1926 had proved a difficult one as regards the working in Cape Town. The industrial troubles which began last May in England affected industries in South Africa to a considerable extent, causing uncertainty in the fulfilment of contracts, and delays in the delivery of goods.

They would see from the accounts that the net profit earned was not quite equal to that of the previous year. The cost of manufacture and distribution had been increased by £1856. It was anticipated last year that, as No. 2 vertical retorts were shut down for repairs, and the working of No. 1 installation was resumed, they would not obtain such good results; and this proved to be the case.

Coal Supplies.

Great difficulties arose in regard to obtaining deliveries of coal through the shortage of railway trucks, which brought about a serious situation. At one time their stock of coal was reduced to 48 hours' supply; and though strong representations were made to the Railway Administration by their officials at Cape Town, in conjunction with other large users of coal, the position for a time remained critical. The only explanation the Railway Administration could offer was that the shortage of trucks arose through delay in the delivery of rolling stock already ordered, and that this delay was due to the industrial situation in England. Towards the last quarter of the year conditions became more normal as to coal supplies; but in order to maintain an adequate output and quality of gas, the tonnage of coal carbonized increased over that of the previous year by 2348 tons.

Expenditure upon repairs of plant, mains, &c., was increased by £1287, due to extended testing and repairing of mains, services, and meters. The outlay incurred had, however, been justified by the saving effected in gas leakage.

Gas Sales.

Revenue from gas sales had increased by £3317; and a satisfactory feature was that, though the volume of gas made increased by 1·4 p.ct., the volume of gas sold was greater by 5·17 p.ct. The figure for unaccounted-for gas showed the substantial saving of over 3 p.ct. It was hoped that still further improvement would be made in this respect during the current year. The number of additional consumers obtained last year was 119; and 307 cookers and 375 geysers were installed—a total of 682 additional gas-consuming appliances.

Residuals.

The sales of residuals declined by £1329. A larger tonnage of coke was made, but more of this fuel was used in the producers and furnaces; and thus the quantity available for sale was not greater. Due to the inferior coal they were obliged to carbonize, a greater proportion of coke made was formed into breeze. As a matter of fact, they could have sold more coke, for the demand was good. The average price they received was 1s. 7d. more per ton, so that the net decrease on coke revenue was little below that of the previous year.

As for tar, the make was larger, and sales increased by 5670 gallons. The market, however, was not good, and the average price realized was 2d. per gallon less. A larger stock of tar had to be carried forward to the current year at a price at which they hoped it would be saleable. Experiments had been made, and are being continued, for producing a tar-bitumen mixture suitable for road construction work; present indications, however, gave little hope of any substantial improvement in price in the near future.

Accounts.

The balance at credit of revenue account was £20,091, which, with the amount brought forward from last year's account made £24,435. Dividends paid amounted to £7500; and after providing reserves, there remained an available balance of £7935. Out of this the Directors recommended the payment of a final dividend of 4 p.ct. on the ordinary shares, which would leave the sum of £3935 to be carried forward to the accounts for the current year.

Future Outlook.

Competition with the electrical lighting and power supply, continued the Chairman, was keen, but the prospects of their business might be considered satisfactory. For cooking and heating purposes, gas was the most efficient and economical agent. The building trade was working at high pressure. New factories were being built and blocks of flats erected in many parts of the city, so that new avenues for gas business should be opened—particularly for the use of gas industrially.

He formally moved that the Directors' report and statement of accounts for the year ended Dec. 31, 1926, be received, approved, and adopted, and that a final dividend of 4 p.ct. (less income-tax), making 7 p.ct. for the year, be declared on the ordinary shares, payable forthwith.

Mr. C. W. Lilley seconded the motion.

Mr. E. Nicholls remarked that the Chairman's report showed that the Company was making real progress. The balance-sheet compared most favourably with that of five years ago. The outlook for the future appeared hopeful.

Mr. S. J. Tungay suggested that the Auditors' fees were high.

Mr. Blackburn explained that they were not high in relation to the services which the Company received from their Auditors. Their Company was in a different position from a concern in this country; and though their business was increasing, which implied increased work for the Auditors, their fees had not been raised. Moreover, there was a double audit—one in Cape Town, and one in this country.

The resolution was carried.

Mr. Lilley then moved the re-election of Mr. H. R. Savory as a Director of the Company.

This was seconded by Mr. R. A. Fairclough, and carried *nem. con.*

Following the thanks of the Chairman for his re-election, Mr. A. E. Hayes proposed, and Mr. Nicholls seconded, that Messrs. Kemp, Chatteris, Nichols, Sendell & Co. be re-elected Auditors.

This was carried.

The final business of the meeting was a vote of thanks to the Chairman, Directors, and Staff, which was proposed by Mr. Nicholls.

Mr. Hayes, in seconding this, suggested that it would be a good idea if the Company would consider inaugurating a benevolent fund.

Mr. Blackburn said the Company was very loyally served by its officials and staff; this had been specially evident during the difficult times in the past year. The question raised by Mr. Hayes had received some preliminary consideration; and as soon as the Company's circumstances permitted, it would have the attention of the Directors.

SOUTH AFRICAN LIGHTING ASSOCIATION, LIMITED.

ANNUAL MEETING.

The Thirty-Eighth Ordinary General Meeting of the shareholders was held at the Association's offices, No. 48, Copthall Avenue, London, E.C., on Wednesday, May 18. Mr. WILLIAM CASH, F.C.A., Chairman of the Association, presided.

The SECRETARY (Mr. William Cash, Jun.) read the notice convening the meeting.

The minutes of the Annual General Meeting, held on June 9, 1926, were read, confirmed, and signed.

The SECRETARY read the Auditors' report on the accounts and balance-sheet.

The CHAIRMAN, in moving that the Directors' report and accounts for the year ended Dec. 31, 1926, be approved and adopted, said that at the last annual meeting the Directors had had to acknowledge that the results for the year 1925 were disappointing; and for the first time in the history of the Company, for reasons which he had then outlined to the shareholders, the Directors did not recommend the payment of any dividend. At that time the present Engineer and Manager (Mr. J. E. B. Potter) had been but recently appointed, having arrived in Port Elizabeth in November, 1925, so that the 1925 results were entirely unaffected by anything that Mr. Potter had been able to accomplish.

The story of the Association's transactions and business for 1926 might be summed up by saying that there had been a gradual improvement all the way through the year. A great deal of work had been done on the overhaul of the works at Port Elizabeth, including the thorough repair of the two smaller holders, a considerable amount of work had been done on the mains, further tests had been made, considerable renewals effected, and, in addition, a good deal had been done in clearing out the mains so as to get rid of the troubles which had arisen from insufficient pressure. The works, mains, valves, and apparatus generally had been overhauled, and some of the roofs of buildings had been repaired, at the expense of the Renewal Fund which was created for that purpose. He had stated at the previous annual meeting that the fund, which had then amounted to £9585, was, in the opinion of the Directors and on the advice given to them, adequate for all the purposes for which it was required. By far the major portion of the necessary work had now been accomplished, and at the end of 1926 the Renewal Fund amounted to the sum of £3612. The Engineer in London and Mr. Potter had stated that the works were now in good order, and that the work still remaining to be done was not of a substantial character. In other words, the sum still available was more than sufficient.

During the year, Mr. T. N. G. Jennings, one of the Directors of the Association, had again passed through Port Elizabeth, and had been able to spend a full day and a little more with Mr. Potter. Mr. Jennings had informed the Directors that he had found a marked improvement in the appearance of the works, and was satisfied that Mr. Potter had rendered good service. Furthermore, in carrying out the overhaul, the various portions of the apparatus were improved, so that not only was the charge entirely one which might be described as overhaul and repair, but it included some improvements.

With regard to the amount of business done, it was satisfactory to know that the sale of gas at Port Elizabeth, which for the first half of 1926 had shown a decrease of some 3 p.ct., had shown an increase for the whole year of very nearly 4 p.ct. Even at Grahamstown, on the figures for the whole year, there was a small increase in the amount of gas sent out; and this he regarded as particularly satisfactory, having in view the position at Grahamstown and the competition of electric light which the Association had had to meet.

Discussing the question of leakage at Port Elizabeth—which had been referred to on so many occasions—the Chairman said that Mr. Potter, after a long investigation, and after carrying out certain work which undoubtedly would eliminate some of the leakage, had found that in the past there had been some tampering with the mechanism of the station meter. It was difficult, therefore, to compare a result expressed as a percentage for 1926 with a percentage for 1925, because it would appear as though there had been some over statement of the quantity of gas actually made. The only true basis for comparison was that of the sale per ton of coal—a figure on which there could be no question. At Port Elizabeth the sale per ton of coal showed an improvement of over 1000 c.ft. per ton. The leakage at Port Elizabeth was down to less than 10 p.ct. It had been improving all through the year, so that one could anticipate and hope that for 1927 the results would be better still.

At the previous meeting he had stated that it was hoped to go back to the use of cheaper coal. The Association had been buying a more expensive coal than previously in the hope of getting better carbonization results, but the extra cost of the coal was not justified by the results obtained; so that in 1926 the price of coal per ton was reduced by something like 4s. at Port Elizabeth, and nearly 2s. at Grahamstown. This, combined with the better make, had meant a saving at Port Elizabeth and Grahamstown together of a substantial sum. Gas receipts were up; and this was accounted for partly by the increase in price at Port Elizabeth, and partly by the additional quantity, which alone had brought in nearly £1000 more at Port Elizabeth. With coke they had done slightly better; but the tar market had been very difficult, and the actual result was worse than in the previous year by nearly £600 on the two works combined. The sale of stores and fitting work had been adversely affected by the wages question, certain wages being now regulated by legislation in South Africa; and steps were being taken to increase the charges to consumers for work done for them.

The expenses in London had been reduced somewhat in 1926. The shareholders might be interested to know that, having regard to the fact that in 1925 no dividend was paid, the Directors had felt that they ought to assist as far as possible, and they had reduced voluntarily their fees to the extent of one-third in respect of 1926. He hoped the shareholders would think that the Directors had done what was right and fair in the circumstances as between the shareholders and themselves. In 1925, what profits there were had been carried forward to the year 1926, the amount carried forward having been increased by £843. In 1926 the profit had increased, as compared with 1925, from £2711 to £5256—an increase of £2545, or nearly double. The Directors felt, therefore, that it was again reasonable to recommend the payment of a dividend. The debenture interest had increased by £200. They had been able to save money, however, on the net charge for income-tax by reason of the Dominion income-tax relief. The Directors therefore were going to propose a dividend of 3 p.ct. for 1926. He would call attention to the fact that the rate of income-tax, having regard to the Dominion income-tax relief, was now only 2s., so that the net dividend was £2 14s.; and if this were considered as an ordinary dividend subject to tax at 4s., it would be seen that the Association was really paying a dividend equivalent to £3 7s. 6d. In addition, he pointed out that the carry forward would again be increased by the sum of £540. On the whole, therefore, he believed it would be agreed that the results for 1926 were more satisfactory; and he was particularly pleased to think that they were progressively more satisfactory.

At the previous meeting he had referred to the fact that the Directors were about to issue the remaining £5000 of Debentures, and he had stated that the Directors and their friends would be prepared to take up such as were not applied for, though at the same time they had given the shareholders the opportunity of applying for such as they desired. The whole £5000 was subscribed, and of this the Directors took about £4000 worth. He mentioned that not as a matter of particular credit to the Directors, but because it showed that they had confidence, and believed that it was a good investment; also that the undertaking was emerging from the difficulties with which it had been confronted in recent years.

In the year that had passed there had been a substantial charge for repairs of mains, and this charge would certainly be reduced during the current year. The working results, too, would be on an improved basis for the whole year. The Directors had received a cable from Port Elizabeth during the last week stating that sales for the first quarter of this year were 5 p.ct. more than in 1926. Grahamstown continued to hold its own; but, of course, there might be certain consumers there who would yet transfer to electric light. The number of stoves and geysers was steadily creeping up. At Port Elizabeth a considerable amount of building was still going on. As he had said before, the Directors always regarded Port Elizabeth as a progressive town. The authorities were proposing to spend a large sum of money on harbour extensions and improvements, which would undoubtedly be good for business. Grahamstown was a residential town, and the growth of the population was slow. The position might be summed up by saying that the outlook was not unfavourable, and that it was improving. The Association would have to spend more money from time to time in Grahamstown on the laying of new mains. Mr. Potter in his report on the transactions of the past year had stated:

> There is not a shadow of doubt that this town (Port Elizabeth) is growing rapidly, and that there are great prospects for the future. New houses are being built in the residential quarters, and large developments are reported. Further, many new factories are being built and under contemplation at the North End. To cope with this, new mains will be needed, particulars of which have already been sent home. The erection of new flats, and the conversion of old houses into flats, is one of the chief works going on at present, and these especially are remunerative. At least 80 flats are being built shortly. The major repairs necessary on the works are now completed.

It was also stated by Mr. Potter, continued the Chairman, that it might be necessary to spend more money on No. 3 holder, though this was sound externally. He was hoping to effect a reduction of wages, and was taking steps to do so. It was difficult to do this, of course, while the repairs and renewals were being carried out. The Directors felt that Mr. Potter was doing really good work for the Association. He had had a trying and difficult time during his first year; and they believed, from what Mr. Jennings had said and from what they had heard from other sources, that they had really got a man whose heart was in the work, and who would do his best for the Association in the future.

Sir CHARLES J. JESSEL, Bart., seconded the adoption of the report and accounts.

Mr. R. A. BROWN, referring to the steps taken to deal with leakages at Port Elizabeth, asked whether the shareholders could now rest assured that these leakages had been discovered as far as was reasonably possible, and that they were not likely to recur. One of the principal causes of the difficulties of the Association had been leakage; and if it had now been restrained to a reasonable point, he believed, with the Directors, that there was good reason for more optimism in the future than had been experienced during the past year or so.

Dr. E. C. CARTER said that, though it was evident that improvement had been effected with regard to leakage, this during the past year had averaged 10 p.ct., and he assumed that in the current year this figure ought to be reduced to something like normal. He believed the average leakage at gas-works was something like 8 p.ct., and that they could not get much below that. In a request for more detailed information as to the nature of the leakage, he said he assumed that part of it was physical leakage, and that the other part was what might be called "moral" leakage at the works. Was there a breach of trust on the part of one or more of the employees, and, if so, had steps been taken to check this dishonesty by prosecution, dismissal, or otherwise? The Directors' report was gratifying

to him, and no doubt to other shareholders also. He looked forward to an increased dividend, and probably also to the extinction of the 8 p.ct. debentures at some time.

The CHAIRMAN replied that the debentures referred to were repayable in December, 1931, and, unless some conversion scheme were adopted, he did not think the Association could get rid of them prior to that date. With regard to leakage, he said that, in the cable he had referred to from Mr. Potter, it was stated to have been reduced to 5¼ p.ct. for the first quarter of this year. It was a little dangerous, however, to rely on the figure for any quarter, because, for instance, individual meters might be read a little earlier than usual, and it was better to have a figure for the whole year. He would not like to say that the leakage for the whole year would be 5¼ p.ct., but that figure gave a satisfactory indication of the position. For the last quarter of 1926 it was lower than that. It was quite true to say—and that was why one hesitated to make any comparison of leakage as between 1925 and 1926—that part of what was an apparent statistical leakage, or "moral" leakage, was due to improper tampering with the station meter, not that that meant any monetary advantage to the people who did it; he supposed they wanted to claim to have obtained better working results than the apparatus indicated. However this might be, the people responsible were dismissed. This was the proper and obvious step to take, and it was the only one the Association could adopt. The real test was the sale of gas per 1000 c.ft. made, and on that there had been improved results last year. Statistically, the leakage worked out at something under 10 p.ct., and he believed that this figure was probably about right, because in 1926 the repairs of mains and overhaul of holders had been carried out, and a certain amount of physical leakage had been discovered.

The report was unanimously adopted.

DIVIDEND.

The CHAIRMAN moved that a dividend of 3 p.ct. for the year 1926, subject to income-tax at 2s. in the £, be declared. In asking Mr. Jennings to second the resolution, he again referred to that gentleman's visit to the works at Port Elizabeth in February of this year (the second such visit), and pointed out that it was a great advantage to the Association to have a Director able to meet the Association's officials on the spot.

Mr. T. N. G. JENNINGS, seconding the resolution, expressed the view that the payment of the dividend was justified. The Association had really earned more than that during the year, but had increased the carry forward. It was true that they had had to resort to the bank for an overdraft during 1926; but he hoped that during the current year it would be very largely reduced, or possibly extinguished. Discussing his visit to the works, he said his boat had stopped at Port Elizabeth for a day-and-a-half on its way round the coast. He had spent nearly all of that time at the works, and in going round the district with the Manager and the Secretary. He had called at Port Elizabeth again on his way home, and had been able to bring back the most up-to-date information. He had been pleased indeed with the improved appearance of the works. They were much more ship-shape. One saw roofs on buildings which previously were conspicuous almost by their absence. Painting also had been done where necessary, the coke yard cleared up and large accumulated stocks disposed of; the tar plant overhauled; the two small gasholders entirely renovated; and the staff seemed to be working energetically and well. There was no doubt that the town was increasing in size. He did not say that progress was rapid; but new factories and new blocks of flats were going up. What business there was the Association was getting, except in cases where it involved large expenditure of mains, which could not be entertained to-day. The Association had a good and energetic Manager in Mr. Potter. His colleagues worked very well with him; and he seemed to be generally liked. The future of Port Elizabeth seemed to be assured. It was one of the chief ports of the Union. The Government was spending money on harbour works, which would presumably bring increased business to the town, because there would be better facilities for shipping; and the Association could look forward to a reasonably prosperous year. One fact which indicated that the business was now better conducted than formerly, and that the Association was giving more satisfaction to its consumers, was that the number of complaints had dropped to a minimum.

The resolution was unanimously adopted.

RE-ELECTION OF MR. CASH.

Mr. HENRY WOODALL, proposing the re-election of Mr. William Cash, the Chairman of the Association, expressed the hope that Mr. Cash would continue to serve as Chairman for many years. It was unnecessary for him to point out how much the Association valued Mr. Cash's services. The shareholders knew as well as did the Directors what a great experience he had had in the management of gas undertakings, and the Association was fortunate in having him as Chairman.

Sir CHARLES J. JESSEL, Bart., seconded.

The resolution was carried unanimously.

The CHAIRMAN, in expressing his thanks, said there was not much doubt that the future of the Association would be brighter than had been the immediate past.

On the motion of Mr. R. M. LONG, seconded by Mr. HARRY S. WHILE, Mr. Percival D. Griffiths, F.C.A., was re-elected Auditor, at the same remuneration as previously.

VOTES OF THANKS.

The CHAIRMAN, proposing a vote of thanks to the officers and staff in South Africa and in London, paid a tribute to Mr. Potter (the Engineer and Manager) and Mr. E. M. Sterley (the Secretary) in South Africa.

Mr. F. R. SMITH, who seconded, also paid a tribute to Mr. Potter, and to Mr. William Cash, Junr. (the Secretary in London).

The vote of thanks was carried with acclamation.

The SECRETARY, in a brief response, said that the officers and staff in South Africa particularly derived great encouragement from the knowledge that the shareholders appreciated their efforts.

On the motion of Mr. R. M. LONG, seconded by Dr. E. C. CARTER, a hearty vote of thanks was accorded the Chairman and Directors. The Chairman briefly responded, and the meeting closed.

MONTEVIDEO GAS AND DRY DOCK COMPANY, LTD.

Another Increase in Dividend.

The Fifty-Fifth Ordinary General Meeting of the Company was held on Tuesday, May 17, at Dashwood House, Old Broad Street, E.C.—Mr. FRANK H. JONES, M.Inst.C.E. (the Chairman), presiding.

The LONDON MANAGER AND SECRETARY (Mr. Henry Kearns) read the notice convening the meeting and the report of the Auditors; and the minutes of the last meeting were taken as read, as also were the report of the Directors and the statement of accounts for the year ended Dec. 31.

The CHAIRMAN remarked that at the last meeting he mentioned that Mr. Charles Hunt, their former Chairman, had relinquished that position; and he had now to tell the shareholders that as Mr. Hunt found it impossible to continue taking an active interest in the Company, he decided to resign at Dec. 31 last. They all hoped that the freedom from business worry would be beneficial to Mr. Hunt; and he was sure the shareholders would wish to put on record their appreciation of his services to the Company over a period of nearly 22 years. ["Hear, hear."] It would be noticed from the report and accounts that the capital of the Company had been increased by £100,000, which was issued in the form of 6 p.ct. mortgage debenture stock, redeemable in fifteen years from Sept. 1, 1926, and that the amount required for redemption for the four months to Dec. 31, £1666, had been transferred from the profits of the year, together with the whole cost of the issue, including discount, amounting to £7015. The capital expenditure had amounted to £19,832, and the capital account was over-spent by the small sum of £251. The Company still had expenditure before them for the enlargement and replacement of some of the old plant; but he believed that after the present year the additions to capital would be lighter, although in a live Company such as theirs, established in a City which was continually growing, capital expenditure could never cease. He did not, however, think they would need much further capital expenditure on plant for the next few years, except for the purchase of mains, meters, and cookers, which were, of course, all revenue-earning.

A GROWING BUSINESS.

Although the capital expenditure during recent years had been heavy, he considered that the money had been well spent; and this was proved by the continued increase in the business year by year. The increase in the sales last year, as compared with 1916, was no less than 107 p.ct., while the capital expenditure had increased during that period by only £94,687, or less than 20 p.ct. The stock of coal at Dec. 31 was about 10 p.ct. lower in quantity, but the cost was £247 more. The shareholders would be interested to know that the seven months' coal strike did not cause the Company any inconvenience, as they had contracted at the commencement for American coal of excellent quality, of which they had had previous experience. They had never failed to provide the city with a full supply of gas; and they did not increase the price to the consumers. Owing to their large stock at the time of the strike, and the early purchase of American coal, the cost over the whole year averaged slightly below that of the previous year; but towards the closing months of the year there was such a large demand for tonnage from the United States that freights rose rapidly. The Company would feel the effects of these higher freights on the cost of coal during the first three months of this year; but it was hoped to reduce the average cost before the year terminated. The value of residuals remained low during most of the year; and it was not until the end of October that the effects of the coal strike were really felt in Montevideo, when prices rose, and there was a good demand for coke. The average price received by the Company, however, was 6s. 6d. per ton less than in the previous year; but a larger tonnage having been disposed of, the cash receipts showed an increase. Sundry debtors were £4276 higher; and the item contained rather heavy amounts due to the Company by Government Departments for gas and residuals. As explained last year, the question of Absentee Landlords Tax was not finally settled. He could only repeat what he then said—that it was inconceivable that such a tax was meant to apply to a Company like theirs; and the Directors were taking all possible steps with the object of obtaining relief.

SATISFACTORY FEATURES OF THE ACCOUNTS.

One of the most satisfactory features of the balance-sheet was that, instead of a loan from the bank of £20,400, as at Dec. 31, 1925, they had at the end of 1926 £35,853 in cash and £52,357 in investments. The investment in 5 p.ct. War Loan was taken into the balance-sheet at cost; but to-day the market value was slightly below the price paid. Gas sales showed an increase of 6·04 p.ct.; and all departments contributed to the increase of £21,112 in the revenue. As the expenditure, including maintenance, only increased by £6207, the net revenue was better by £14,904. A further satisfactory item was that of exchange, which showed a loss of £1665

less than in the previous year, notwithstanding that the remittances to London were larger. After providing for interest on the 5 p.ct. and 6 p.ct. debenture stocks, 6 p.ct. debenture stock redemption, and the whole cost of the issue of the 6 p.ct. stock, including discount, there was a balance of £52,996 available, which enabled the Board to recommend that the dividend for the second year in succession be increased by 1 p.ct.—namely, from 5 to 6 p.ct., free of tax—and to increase the carry forward by £4723 to £20,481. Since the last meeting, Mr. Whyte, their General Manager in Montevideo, had visited England; and the Directors had had the opportunity of discussing with him the various projects for most economically enlarging the manufacturing plant, the overhaul and enlargement of the mains, and the general manufacturing operations. It was felt that these interviews would be conducive to the further success of the Company. He concluded by moving the adoption of the report and accounts.

Mr. EDGAR HORNE seconded the motion.

The report and accounts were then unanimously adopted; and afterwards it was agreed, on the proposition of the CHAIRMAN, seconded by Mr. E. B. READ, that a dividend be declared on the ordinary stock of the Company for the half-year ended Dec. 31 of 3½ p.ct., free of income-tax—making with the interim dividend already paid 5 p.ct., free of income-tax, for the year.

The CHAIRMAN said that, when Mr. Hunt retired, the duty fell upon the remaining members of the Board of deciding upon a suitable person to fill his place. The claims of Mr. Cecil C. Mallet in that connection were outstanding; for he had large interests in South America, and went out there periodically. He had been acquainted with the undertaking for many years; and his local knowledge would prove invaluable. The Board were convinced that in Mr. Mallet they had selected the right man; and he moved that he be formally elected a Director of the Company.

Mr. HORNE seconded this, and it was carried.

On the motion of Mr. HORNE, seconded by Mr. READ, Mr. Frank H. Jones was re-elected a Director; and the Auditors (Sir Laurence Halsey and Mr. William C. Sneath) were re-appointed, on the proposition of Mr. BELL, seconded by Mr. R. W. WESTERN.

The CHAIRMAN proposed a hearty vote of thanks to the staff in Montevideo and London, and referred to the splendid work done by Mr. Kearns and by the General Manager (Mr. Whyte). He was sure no undertaking possessed a more efficient and loyal set of officers than did their Company.

Mr. MALLET, who seconded, spoke from his personal experience of Montevideo, of the devoted service of those employed by the Company.

Mr. KEARNS briefly acknowledged the vote; and the proceedings were brought to a close with an expression of the thanks of the meeting to the Chairman and Directors, which was proposed by Col. A. G. HIPWELL, C.B., and seconded by Mr. C. HOLMES HUNT.

CO-PARTNERSHIP AT CROYDON.

Mr. William Cash's Review of a Thriving Institution.

Seldom can the North End Hall at Croydon have been as completely filled with such an appreciative audience as was the case on Monday evening of last week, May 16, when co-partners and their wives, to the number of about a thousand, in the Croydon Gas Company assembled for their annual meeting, and to enjoy an excellent entertainment programme which had been prepared for them. The entire smoothness of the arrangements spoke volumes for the trouble taken by those officers who had had a hand in them; and the general pleasure was shared in to the full by Mr. William Cash, F.C.A., the Chairman of the Company (and of the Co-Partnership Committee), who presided, and those of his colleagues who were able to be present. Indeed, Mr. Cash was obviously gratified at the numbers he had to address; and referring to the fact that it has been found necessary to obtain larger, and yet larger, accommodation for these gatherings, he smilingly foretold the time when it might be necessary to secure for them the Crystal Palace.

Supporting Mr. Cash on the platform were Messrs. Thomas Rigby (Deputy-Chairman), Charles Hussey, J.P., and Harold Williams, O.B.E., F.S.I. (Directors), Mr. W. J. Sandeman (Distribution Engineer and Sales Manager), Mr. Archibald Caddick (Engineer and Works Manager), and Mr. F. F. Wood, A.C.I.S. (Secretary). The other Directors (Messrs. Henry Woodall, M.Inst.C.E., J.P., Percy H. Hall, J.P., and William J. Russell) were, to their regret, unable to be present. The business portion of the proceedings was preceded by music, and followed by light refreshments and a number of well-selected items by Fred Wildon's 1927 Margate Entertainers.

A BONUS OF 6½ P.CT.

Mr. CASH, in submitting the Committee's report and co-partnership accounts for the year ended March 31 last, said the bonus was at the rate of 6½ p.ct., the same as for the previous year—being the average rate at which dividend was paid on the sliding-scale stock of the Company for 1926. Having regard to the great difficulties of the year, it was satisfactory that the bonus should be at the same rate again. Really, a bonus of 6½ p.ct. was not an unsubstantial amount. At a rough calculation, it was equal to about three weeks' wages. From the inception of the scheme in 1909, 1636 co-partnership agreements had been entered into; and the number of co-partners at March 31 last (895) was the highest that had been reached. The total amount of the bonus, at £10,635, was also the largest sum that had been so distributed. The total sum held by the Trustees for the co-partners at March 31 was £23,097. The sums deposited by co-partners as savings (for 17¼ years) amounted to 70 p.ct. of the total credited as bonus.

MR. CADDICK'S RETIREMENT.

Dealing further with the report, Mr. Cash remarked upon the retirement of Mr. W. W. Topley from the Secretaryship of the Company—an event which was regretted by all who knew him—and he then made a similar announcement with regard to another of the chief officers. "As time goes on," he said, "there must inevitably be changes; and probably some of those present know that another of our chief officers has found that the time has come when he ought also to give up active work. I refer to our Engineer, Mr. Archibald Caddick. I am sure that those who have worked with Mr. Caddick, and all who have known him, will echo the regret of the Directors at the fact that, acting upon his doctor's advice, he feels he must retire. He has served the Company 28 years—for exactly half the period under the late Mr. J. W. Helps, and for the other half as Chief Engineer. During that time he had seen a wonderful growth of the Company's business. He has seen the works at Waddon enormously enlarged; and he has in very great measure been responsible for these enlargements. He will leave behind him, apart from the regard which we all have for him, a permanent memorial in the buildings and plant there. He had a great strain upon him last winter; and his doctor tells him that he ought now to take things more easily. Mr. Caddick will carry with him into retirement our very best wishes for renewed health and strength." Mr. F. F. Wood (who succeeded Mr. Topley as Secretary of the Company), after doing valuable work as Editor of the "Croydon Co-Partner" since the beginning of 1915, had now relinquished his editorial duties; and he hoped the new Editor, Mr. A. Tennant, would give them as successful issues of the magazine as Mr. Wood had done.

A DIFFICULT YEAR.

Alluding to the business of the Company during the year 1926, the Chairman said that they met a year ago when the general strike was just over, and when they knew of the stoppage in the coal industry; but no one imagined at that time that the stoppage was going to last as long as it did. Altogether 1926 was a very difficult year for the Company. Having three months' stock of coal in hand, they thought they would have no trouble in carrying on until they could get their coal contracts working again; but, of course, in this they had been grievously disappointed. In time it became necessary to start buying foreign coal; and not only that, but they had to purchase it on a rising market. Even then, they had great difficulty in getting it. When they did secure it, the coal was different from what they had been accustomed to work with. Some of it was not of good quality, though some was fairly good. It was necessary to buy ahead, with the result that they were receiving high-priced coal until well into 1927. This compelled them, with great reluctance, to put up the price of gas. There had been a good many statements in the newspapers lately with regard to high gas bills; but the fact was that people had been using more gas when other fuel was not available, and had gone on using larger quantities at a higher price. Then they seemed surprised when the bills arrived.

PRICE OF GAS.

In the case of their own Company, the pre-strike price was 9·8d. per therm; and it was not until Michaelmas that they put it up at all. Further increases had to be made on Nov. 1, and again at Christmas. This brought the charge up to 1s. per therm. This was not a very big increase, in view of the fact that their foreign coal had cost them two-and-a-half times what they would have paid for English coal under normal conditions. As from Lady-day, they had put the charge down again to 11d.; and the Directors had decided to make a further reduction as from the June meter readings to 10·4d. As soon as things got straightened out again, he had no doubt they would be able to get the price down still further. When the accounts were made up to the end of the year, it was found that they had not earned their dividend; and so it had been necessary to dip into the reserves and carry forward in order to maintain it. It was not a large dividend; and there were reserves which had been put aside to meet a "rainy day." This seemed to the Directors to be a "rainy day." Had the dividend been reduced, it would, of course, have entailed a reduction in the rate of bonus to the co-partners. The men had, however, worked loyally and well under difficult conditions; and it would have been very hard if, in a year such as that, they had had a drop in their bonus. He was glad therefore that the Board had seen their way to pay the same dividend, and consequently the same bonus.

Before resuming his seat, Mr. Cash touched upon two other main features of the Company's operations during the past year. One of these, he said, was the opening of the new Purley showroom, which reflected great credit on the architects and builders, and upon Mr. Sandeman, who had designed a very complete showroom indeed, which was going to do the Company much good in a growing district. The other was the completion of the new retort house at Waddon. This was a fine house, which had been erected entirely without the aid of outside labour. Mr. Caddick was responsible for the designing of the house; and all the drawings had been executed by Mr. Harrisson, the draughtsman at the works. The result reflected the greatest possible credit on both these gentlemen.

The co-partnership report and accounts were unanimously approved.

LONG SERVICE AWARDS.

The next item on the programme was the presentation of long service awards; and the Chairman presented illuminated certificates to thirteen men who had completed 25 years in the Company's employ. In each instance the certificate was accompanied by a gift to the value of £5.

INQUIRY AT EARL SHILTON.

The important question as to the gas supply in the busy manufacturing parishes of Barwell and Earl Shilton was investigated at a Board of Trade inquiry at Earl Shilton on Tuesday and Wednesday of last week, conducted by Mr. J. F. RONCA, Director of Gas Administration at the Board of Trade.

The matter originally arose out of the dissatisfaction, expressed in certain quarters, with the quality and price of the gas supplied by the local Company; it being alleged that the gas was neither so good nor so cheap as that provided in the neighbouring town of Hinckley. The outcome was that the Parish Councils of Barwell and Earl Shilton decided upon, and held, a joint meeting at which they agreed to approach the Hinckley Urban District Council, and request that body to undertake the supply of gas to the two parishes. Parish meetings passed similar resolutions; and the Hinckley Council, when approached, adopted a favourable attitude towards the scheme, and decided to apply for the necessary statutory Order.

A move was, however, made by the Earl Shilton Gas Company, who put in an application to the Board of Trade for statutory powers (which they do not at present hold) to supply Barwell and Earl Shilton with gas, and to extend the area of supply to include Stoney Stanton, Sapcote, Elmesthorpe, Stoke Golding, and part of Thurlaston.

Subsequently an application was made by the Hinckley Urban Council, at the request of the Parish Councils of Barwell and Earl Shilton, for an Order giving the Council power to supply gas in these two parishes. This Order included a clause giving the Council power to purchase the Earl Shilton gas undertaking, mains, &c.

There was a large gathering at the inquiry on the first day; members of the Hinckley Urban Council, the Hinckley Rural Council, the Parish Councils, and of the Company being present. Mr. W. Allen (instructed by Messrs. Sharpe, Pritchard & Co., agents for Mr. A. S. Atkins, Clerk to the Hinckley Urban District Council) appeared for the Council, and Mr. F. Bury (instructed by Messrs. Rees, Freers & Co., agents for Messrs. Watts & Bouskell, Market Bosworth) represented the Company.

Mr. BURY, for the Company, spoke on its establishment, and traced the history of the supply of gas to Barwell and Earl Shilton, from the first moves on the part of the parishes early in 1926.

The Company, he said, was formed in 1865 with a capital of £2000, which was at subsequent dates increased to £5000 and then to £20,000; the present money invested in the undertaking totalling £21,543. Quoting reports, Mr. Bury detailed the various steps that had led up to the inquiry. At present, he said, the Company were operating 6 miles of mains, and there had been no friction with any consumers as regards the quality of the gas that had been supplied, though there was a question of the quality of the gas in war-time, which led to Barwell changing from gas to electricity for street lighting purposes about three years ago.

The inducements held out to the two Parish Councils to approach the Hinckley Council were the quality of the gas and the price. The Urban Council had offered to purchase the Company's undertaking; but the Company had no desire to sell.

Mr. ALLEN, in reply to Mr. Bury, agreed that they were still prepared to negotiate for the purchase of the Company's undertaking.

Mr. BURY, continuing, pointed out that it was the invariable practice of Parliament to say, where a Company—whether statutory or otherwise—was in existence for supplying in an area, "that is your area, and you should not be subject to competition." The Board of Trade were asked to depart from that practice. Following the application of the Company for the Order, a meeting of the Hinckley Rural District Council was held for the purpose of considering the scheme; and it was decided to lodge objections to it. Mr. Bury suggested that the Hinckley Rural District Council were now in favour of the Company's scheme.

Mr. ALLEN replied that he was instructed to the contrary. Representatives of the Council were present to give evidence against the Company's Order.

Mr. BURY, explaining the benefits which the Company had accorded their consumers, said that the Company had encouraged not only the power consumer, and consequently benefited employment, but also the small and poor consumer. Further, during the coal strike, though they were entitled to raise the price of gas to any extent, the Company, rather than do so during a national crisis, kept it at such a figure that the shareholders suffered a loss, from which they were only just beginning to recover. This was a reason why the moment was inopportune and unfair for the purchase of the Company's undertaking. Touching upon the objections to the Order, which among other things were based on the assertion "that the supply of gas and working of the Company's appliances gave dissatisfaction," many of the consumers were willing to say that they were contented with the existing régime. The statement quoted was, he said, true neither in substance nor in fact.

Mr. *Thomas Powers* (Chairman of the Company) said that the mains now were practically new, having been replaced out of revenue. The present dividends were no criterion of the potential value of the Company as a dividend-earning concern. He did not think that the extensions proposed in the Order would increase the price of gas to the consumer. He denied that during the years 1923, 1924, and 1925 there had been complaints about the quality of the gas.

Mr. *Amos Moore*, Junr., (a member of the firm of Moulds & Moore, boot and shoe manufacturers, Barwell), said that the firm used gas for heating, and, with the exception of the period of the coal strike and just prior to it, they were satisfied with the quality of the gas supplied. He was not, however, satisfied with the price, as he thought it was dearer than it ought to be. The gas had never been better than it was now.

Satisfaction with the quality of the gas was also expressed by Mr. *Jack Powers* (of Messrs. Hodgkin & Powers) and Mr. *W. L. Arguile* (of Messrs. Grewcock & Farmer, Barwell).

Mr. *Arthur Valon* said that the plant of the Company was capable of fulfilling all the demands that would be placed upon it, if the Order were passed, though the storage would have to be increased if the consumption grew very much. With regard to the extensions proposed, he did not think it would pay to go out to Sapcote at the moment. But they had five years in which to do so, and he thought it would be possible within that period. If the Hinckley Order was granted, it would be unique in gas legislation. He did not agree that electrical competition in Hinckley would affect the undertaking in the same way as it affected the Company, as Hinckley could afford to sell gas at a lower price. The Hinckley undertaking ought to be able to supply in that district at a lower price than a small company such as the Earl Shilton Gas Company; but this did not always take place. There was a reasonable chance of the Company economically extending the works to the districts named in the Order.

Mr. *Arthur David Lord* (an employee of the Gas Company) said that, apart from the period of the coal strike, he had no complaints of shortage or bad quality of gas. There had been complaints of lack of pressure, but they usually found dead beetles in the nipples of the burners.

HINCKLEY MANAGER'S STATEMENT.

Mr. *F. Lee* (Manager of the Hinckley Urban District Council Gas-Works) gave particulars of the Hinckley undertaking, with regard to both services and charges. The charge to Burbage, supplied by Hinckley, was 5d. per 1000 c.ft. more than Hinckley. The price that would be charged to Barwell and Earl Shilton under the proposed Order for the Council, would be a maximum of 1s. 1d. per therm for five years, after which it would not be possible for them to charge more than 33⅓ p.ct. on the Hinckley price, which at present was 3s. 4d. per 1000 c.ft., making 4s. 1½d. for Barwell and Earl Shilton.

In reply to Mr. Bury, he said he was there to state that the Hinckley works could supply the gas if the Order was granted to the Council. He did not make the policy of the Council; the Council did that. He was, however, prepared to justify the Order.

Mr. *Doig Gibb* also gave evidence of a technical character.

Opposition to the Company's application was provided by a number of local councillors.

Mr. *A. H. Bradbury* (Chairman of the Parish Council, and also a member of the Rural District Council and the County Council) said that as far back as 1910 they had to complain of the quality of the gas used for street lighting in Earl Shilton. Some years ago he had been compelled, at his business, owing to insufficient pressure, to take out a gas engine and instal a suction gas plant. This would have been unnecessary if they had the proper supply from the Company. At his previous residence the gas was so bad that they had to turn out the gas and revert to paraffin lamps. He admitted that he had no complaints to make of the present quality of the gas, but he wondered how long it would continue. He thought it was unfair for them to have to pay extortionate prices when they could be supplied at a cheaper rate by Hinckley.

Mr. *Dan Astley* (a Trade Union Official) said that where private enterprise was already catering for public needs, and functioning properly and well, it ought to be allowed to continue to do so; but he contended that the Earl Shilton Gas Company was not so doing.

Opposition on the part of Barwell was put in by Messrs. *Harvey* and *Freer*, both members of the Parish Council and of the Rural Council. The former, speaking as a manufacturer, said that he opposed the Company's Order on the grounds of the alleged bad quality, low pressure, and high price.

In the summing-up it was put forward by the representatives of the Company that both Orders should be passed—that of the Company as it stood, the Council Order with an amendment to the effect that within a period of six months from the passing of the Order the Council should come to an agreement with the Earl Shilton Company for the purchase of their undertaking, and that within twelve months the agreed price should be paid. If there was default either in agreeing to the price or in the paying of the agreed price, the Hinckley Order should then lapse.

This suggested solution would enable the Hinckley Council to consider the position and consult the constituents. As it was, under the terms of the Hinckley Order, the expenses could be paid without a single person in the town being consulted, and possibly without nine persons out of the ten knowing that any such scheme was going through.

Mr. ALLEN observed that this did not go far enough. If, however, it was left to the Board of Trade to say whether an offer the Council made was a reasonable one in the circumstances, then he would be willing to accept the suggestion. It was at the request of the Barwell and Earl Shilton Parish Councils that Hinckley sought this Order, and there had been strong evidence by members of those Councils that the gas supply had not been satisfactory.

Mr. BURY said that this attempt to invade the Company's area was unprecedented, and was only justified if they were able to show gross mismanagement on the part of the Company. The latter had purposely kept dividends down, so as not to raise the price of gas; and in the years 1923, 1924, and 1925 mains had been renewed out of income with the same object.

The summing-up of Counsel concluded with the suggestion previously referred to; and Mr. RONCA, the Inspector, visited the works of the rival concerns.

Buxton Gas Exhibition.—The gas exhibition and lectures and practical cookery demonstrations organized by the Gas Department of the Buxton Corporation at the Gas Service Showrooms, which concluded on Saturday last, have been a great success. The attendance at each sitting was evidence of the keen interest this enterprising step on the part of the Gas Engineer (Mr. F. G. Shaw) and his Committee aroused in the town.

COAL TRADE REPORTS.

From Our Own Correspondents.

NORTH-EAST COAST.

The depression continues, with no signs of any improvement in market conditions. Inquiry is slow, and Continental agents still insist that prices must be extremely low to compete with other sources of supply. There appears, however, to be little possibility of reducing them below the present levels. A few of the best Northumberland steam collieries have fairly good turns, but many still lack trade to keep them fully working, and the price of 14s. 6d. f.o.b. for screened, with smalls at about 11s., cannot be remunerative for many of them.

Durham trade is equally slow, with coking unscreened offered down to 14s. or 14s. 3d. for prompt shipment. Gas makes are finding difficulty in maintaining quotations. Wear Specials are nominally 17s. to 17s. 6d. f.o.b., and best qualities quote 16s. 6d. to 17s. Seconds are nominally 14s. 9d. to 15s.; but some brands are obtainable at less than this. Ordinary unscreened bunkers are offered at 14s. 6d., and best makes get 15s. 6d. to 16s. 6d., according to place of shipment.

Demand for coke of any kind is not brisk, and more business is required. Gas coke is perhaps the steadiest, and is quoted at about 20s. f.o.b. for shipment.

YORKSHIRE AND LANCASHIRE.

Gas coal inquiries are now in the market in Yorkshire and Lancashire, and some low quotations are operating.

The industrial situation does not improve, owing to the lack of confidence among the large consuming trades.

The demand for house coal is diminishing with the gradual approach of milder weather, so that, with the lack of export business the collieries generally have increased their accumulated stocks of large coal and are also working shorter time.

The following are the Humber bunker and export prices, f.o.b. usual shipping ports: South Yorkshire—Hards, Association, 17s. 3d. to 17s. 6d.; screened gas coal, 17s. 6d. to 18s. 6d.; washed trebles, 17s. to 18s.; washed doubles, 16s. 6d. to 17s.; washed singles, 16s. to 17s.; washed smalls, 15s. 3d. to 15s. 6d.; rough slack, 14s. 3d. to 14s. 6d.; smithy peas, 18s. 6d. to 19s. 6d. per ton. West Yorkshire—Hartleys (f.o.b. Goole), 16s. to 17s.; screened gas coal, 17s. to 18s.; washed trebles, 16s. to 16s. 6d.; washed doubles, 16s. to 16s. 6d.; washed smalls, 14s. 6d. to 15s.; unwashed trebles, 15s. 6d. to 16s.; unwashed doubles, 15s. to 15s. 6d.; rough slack, 14s. to 14s. 3d.; coking smalls, 13s. 6d. per ton. Derbyshire and Nottinghamshire—Top hards, 18s. 6d. to 20s.; washed trebles, 18s. to 19s. 6d.; washed doubles, 17s. 6d. to 18s.; washed singles, 17s. to 18s.; washed smalls, 15s. to 15s. 3d.; unwashed doubles, 15s. to 16s.; rough slack, 14s. 3d. to 14s. 6d. per ton. Yorkshire, Derbyshire, and Nottinghamshire—Screened steam coal, 15s. 6d. to 16s. 6d.; gas coke, 22s. 6d. to 25s.; furnace coke, 19s. per ton.

MIDLANDS.

There is an irregular revision of prices in progress which probably would not be over-represented by an average decline of 1s. While the retrogression is mainly in the house-coal branch, industrial qualities are not exempt from the tendency. There is a wide difference between the prices at which spot lots are being offered and the quotations in collieries' lists. The lowest grades for domestic sales can be obtained at less than 20s. at the pithead. Best deep hand-picked ranges up to 33s. or even a little more.

For steams 17s. to 18s. is generally quoted. The trade is very quiet; and with more coal being raised in three or four days a week than the market can absorb, consumers on the look-out for bargains can pick up spot lots at very much reduced rates. D.S. nuts make from 12s. to 14s., and beans about 1s. less. The diminished output of slacks keeps values steady at 8s. to 11s.

As usually happens, the break in the front of the cokeries has quickly developed into a debacle, or something approaching it. Hard furnace cokes have been obtainable in this area at 16s., and even a lower figure is said to have been accepted. Easier prices for pig iron have only given a temporary fillip to the market, and business is again very dull.

CONTRACTS OPEN.

Coal.

The Sleaford Gas Company are inviting tenders for the supply of gas coal. [See advert. on p. 522.]

Tenders for the supply of gas coal are invited by the Dewsbury Gas Department. [See advert. on p. 522.]

The Borough of Newcastle-under-Lyme are inviting tenders for the supply of gas nuts and beans. [See advert. on p. 522.]

Meters.

The Stockton-on-Tees Gas Department are inviting tenders for the supply of meters. [See advert. on p. 522.]

Paints, Oils, Sulphuric Acid, &c.

Tenders for the above and other goods are invited by the Stockton-on-Tees Gas Department. [See advert. on p. 522.]

Pipes, &c.

Tenders for mains and specials and wrought-iron and compo piping are invited by the Stockton-on-Tees Gas Department. [See advert. on p. 522.]

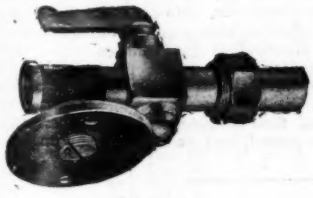
Purifiers.

The Gas Committee of the Holme Cultram Urban District Council are inviting tenders for the supply of four purifiers. [See advert. on p. 522.]

We Specialize !!!

IN

GAS FIRE TAPS.



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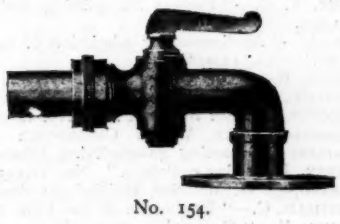


No. 154.

Prices Right! *Quality Right!*

Finished in Polished Brass, Oxidised Copper, or Oxidised Silver.

May we quote you?

SAWER & PURVES

BRANCH OF METERS, LTD.

45 & 47, WESTMINSTER BRIDGE RD., LONDON. MILES PLATTING, MANCHESTER. RADFORD ROAD, NOTTINGHAM.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

London, *May* 23.

The market for pitch continues steady, and there is a fair amount of inquiry for next season's shipment. The price remains unchanged at 75s. to 80s. per ton in bulk at makers' works.

Creosote is firm at 8¾d. to 9d. per gallon.

Pure toluole is about 1s. 10d. to 1s. 11d. per gallon, pure benzole about 1s. 8d. per gallon, and 95/160 solvent naphtha about 1s. 6d. per gallon.

Phenol is steady at about 8¾d. per lb.

Tar Products in the Provinces.

May 23.

The average values of gas-works products during the week were: Gas-works tar, 54s. 6d. to 59s. 6d. Pitch—East Coast, 70s. to 75s. f.o.b. West Coast—Manchester, 67s. 6d. to 74s. 6d.; Liverpool, 70s. to 75s.; Clyde, 72s. 6d. to 75s. Benzole, 90 p.ct. North, 1s. 5d. to 1s. 6d.; crude, 65 p.ct. at 120° C., 1s. 0¾d. to 1s. 0¾d., naked, at makers' works; 50-90 p.ct. naked, North, 1s. 6d. to 1s. 7d. Toluole, naked, North, 1s. 6¼d. to 1s. 7¼d., nominal. Coal-tar crude naphtha, in bulk, North, 7¼d. to 8d. Solvent naphtha, naked, North, 1s. 2¼d. to 1s. 3¼d. Heavy naphtha, North, 1s. to 1s. 1d. Creosote, in bulk, North, liquid, 7¼d. to 7¾d.; salty, 7¼d. to 7½d.; Scotland, 7¼d. to 7¾d. Heavy oils, in bulk, North, 9d. to 9¼d. Carbolic acid, 60 p.ct., 2s. 6d. prompt. Naphthalene, £11 to £14; salts, £5 to £5 10s., bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

TRADE NOTES.

Coal Drying Plant.

The Bolsover Colliery Company Ltd., have placed an order with the Woodall-Duckham Vertical Retort and Oven Construction Company (1920), Ltd., for a Carpenter centrifuge for coal drying. The plant, which will have a nominal capacity of 50 tons per hour, depending on the sizes of the coal to be dried, is to be erected at the Clipstone Colliery.

Gas Masks.

Messrs. Wallach Bros., Ltd., 49, Tabernacle Street, Finsbury Square, E.C. 2, have published a new list of gas masks specially suitable for use in gas-works. Particular attention is drawn to the "Evertrusty Degee" CO mask, which gives protection against carbon monoxide. The firm will be pleased to send a copy of their new list to any of our readers who may be interested.

"DEAC" Hand Lanterns.

The success of a hand lantern for use in gas-works, for inspection purposes, &c., depends on its ability to withstand comparatively rough usage without its reliability being affected. The makers of the "Deac" nickel-steel cadmium lamp—the Deutsche Edison Accumulator Company (Sole Concessionaires: A.F.A. Accumulators, Ltd., 120, Tottenham Court Road, W.1)—claim that their product is both reliable and durable. A new price list of their various patterns of hand lanterns has been published.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for May 18.]

Nos. 12,334-13,040.

Aktiebolaget Separator.—"Process for dehydration of water gas tar emulsions." No. 12,789.

Beadle, E.—"Gas stoves." No. 12,661.

Bunge, F. C.—"Process for splitting coal into its constituents." No. 12,919.

Coe, A.—"Appliances for admission of steam to vertical gas retorts, &c." No. 12,978.

Durand, E.—"Gas valves." No. 12,759.

Harwood, A. R.—See Beadle, E. No. 12,661.

Pistorius, A.—See Bunge, F. C. No. 12,919.

Rhenania-Kunheim Verein Chemischer Fabriken Akt.-Ges.—"Apparatus for roasting gas-purifying substances." No. 12,771.

Smalley, J.—"Gas radiators." No. 12,595.

Steward, C. O. M.—See Aktiebolaget Separator. No. 12,789.

Whitfield, C.—"Production of gas from solid fuel." No. 12,354.

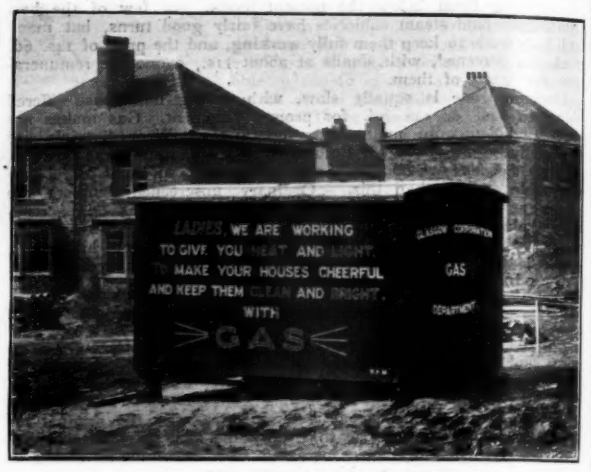
Wright, F.—"Gas-saving device." No. 12,352.

Gas Exhibition at Oswaldtwistle.

A Gas Exhibiton, organized by the District Council Gas Committee, was opened at the Oswaldtwistle Town Hall on May 17, by Councillor W. H. Greenwood, the Chairman. Councillor T. Scholes took the chair. The Chairman said that the price of gas was being reduced from June. Councillor Greenwood remarked that gas charges in Oswaldtwistle were low compared with most towns, so that those who invested in appliances for lighting, heating, and cooking had an advantage. Credit was due to the Gas Manager, Mr. Ames, and his staff, and also to the Chairman of the Gas Committee. Much money had been spent during the last two years in reconstructing the gas-works; and it reflected credit on the Manager that he had been able to keep the price so low in view of the high cost of alterations. A wonderful demand for gas appliances had taken place since the exhibition of two years ago; 1350 cookers, fires, boilers, and irons having been sold. They had 3000 consumers; and considering the bad times through which they had passed, the results were remarkable. The gas sold had increased by 17 million c.ft.—an increase of 16 p.ct. During the year new showrooms had been opened. Gas equipment, he added, meant easy home management and the abolition of drudgery.

MOVABLE WORKSHOP FOR GASFITTERS.

The accompanying photograph, which has been sent by Mr. E. Edison Stones, Assistant General Manager to the Glasgow Corporation Gas Department, is of a temporary workshop for gasfitters erected on the Knightswood Housing Estate, Glasgow. This estate, when completed, will have on it about 6000 houses; and the workshop is sectionally constructed so as to be easily moved from site to site. The wording on the workshop is by Mr. R. F. Morrison, the author of Sir Harry Lauder's famous song, "A wee deoch an' doris."



Coke Oven Gas for Accrington.—The Accrington and District Gas Board are entering into an agreement with the Altham Colliery Company to take a large supply of gas from the firm, who are installing a new type of coke oven at their Moorfield Colliery. It is estimated that the gas thus generated at the pithead will total 1¾ million c.ft. per day, or five-sixths of the Board's output. The gas will be conveyed from the coke ovens to the Board's works at Great Harwood by a special main. The agreement covers ten years; and the scheme will obviate the necessity for extensions to the Board's plant for many years to come.

Further Reduction in the Price at Altrincham.—The Directors of the Altrincham Gas Company intimate that, as from the date of the meter readings for the June quarter, the price of gas will be reduced 1d. per therm (equivalent to 4½d. per 1000 c.ft.), subject to the usual discount of 5 p.ct. if payment is made within the prescribed period. This is the second reduction during the present year; the previous one being 4½d. per 1000 c.ft. as from the meter readings in March last. The figure is now down to the pre-strike price—viz., 3s. 2½d., *less* the customary discount.

Favourable Report at Macclesfield.—At a meeting of the Macclesfield Gas Committee on May 17, the Chairman (Councillor Vernon Hope) stated that, in spite of the coal dispute, the balance-sheet was of a very satisfactory nature. While the price of gas had only been increased by 20 p.ct. for the December and March readings, the profit made was £926, notwithstanding an extra expenditure of nearly of £20,000 on coal and retort renewals. He proposed that a 20 p.ct. and also a 1½d. per therm reduction should come into operation after the June meter readings. Macclesfield gas charges would then be 7½d. per therm maximum price, to about 4d. per therm minimum price. Great credit for the successful issue out of the troublesome times they had experienced in the past twelve months was due to the energies and assiduity of their Engineer and Manager, Mr. H. Curtis. The proposals were passed, and await confirmation.

It has been decided to reduce the price of gas at Oldham on June 25.

It was reported to the Plymouth Town Council on Monday, May 9, that sanction had been received to a loan of £16,364 for the laying of a new trunk gas main in Devonport, repayment to be spread over 30 years.

Gas cookery demonstrations were given last week at Messrs. Fenwicks, Newcastle. Miss E. M. Dodds and Miss Freda Wood were the demonstrators. All types of gas appliances for cooking, heating, and hot water supply were on display.

The Modern Transport Company, Coal and Coke Exporters and Contractors announce that, as from Monday last, their address will be No. 8, Lloyds Avenue, London, E.C. 3. Telephone: Royal 8308/9. Telegraphic Address: "Modport Fen London."

At the opening, by the Mayor, of a new bowling green for Blackburn tramway employees, on May 11, Mr. G. P. Mitchell, the Corporation Gas Engineer, won the special prize in a bowling competition organized for the benefit of the town's Infirmary Memorial Wing.

At the annual meeting on Thursday, April 28, of the Holsworthy Gas and Electricity Company, Ltd., a profit on the year of £706 was reported. During the year a bench of four retorts was installed at the gas-works. It was decided to declare a dividend of 4. p.ct.

STOCK MARKET REPORT.

THE gradual improvement in values which had been the feature of the stock markets during the past month was suddenly checked last week. Up to Thursday the gilt-edged market had been tolerably firm; but the announcement that the Bank had sold £1,500,000 bar gold not only caused the prices of leading Government securities to sag, but also destroyed any hope of a further immediate reduction in the Bank Rate. The recent flood of new issues also adversely affected the position. The depression extended to the Foreign Market, and some appreciable liquidation of shares followed the slump on the Berlin Bourse.

Industrially, however, the prospects are good. With the decrease in the number of the unemployed, there were confident forecasts in respect of the accounts for the current year. There were some bright spots in the Miscellaneous Market—Shipping, Newspapers, and Oils all being fairly strong; but Tobaccos, Rubbers, and Teas were dealt in at lower prices.

The feature of the week in the Gas Market was the rise of 5 points at the local exchange in the Sheffield "A," "B," and "C" stocks. At the average price of 101, the yield on the last dividend is £5 13s. 10d. p.ct., which is low for this class of stock. Local interest would perhaps account for the high price. Among other improvements were British ordinary, which rose 1 point to 106-109, South Suburban 1 to 103-106, and Tynemouth consolidated and new 1½ to 71-72. The publication of the Primitiva accounts confirm the anticipation of a substantial improvement in the Company's affairs. Again no dividend is recommended, but the balance of profit was considerably higher at £97,947 against £56,385.

The following transactions were recorded during the week:

On Monday, British 4 p.ct. debenture 75½, Gas Light and Coke 87, 87½, 3½ p.ct. maximum 59½, 60½, 3 p.ct debenture 59⅞, Imperial Continental 137, 137½, 138, 139, Liverpool 7 p.ct. preference 101, Oriental 99, 99½, Primitiva 14s. 9d., 14s. 10½d., 14s. 11½d., 15s., 15s. 1½d., 15s. 3d., 15s. 6d., South Metropolitan 100½ 101½, 101⅝, South Suburban 5 p.ct. 103½, Tottenham "B" 91, Wandsworth "C" 91½, Epsom stock 105. Supplementary prices, Barnet 5 p.ct. debenture 97½, Tottenham 7½ p.ct. mortgages, 1931-36, 101½, 102, Wandsworth 3½ p.ct. new 91½, Yorktown and Blackwater new 5 p.ct. preference 89.

On Tuesday, Alliance and Dublin 85, Bournemouth 6 p.ct. preference 11¼, British 107, 107⅜, 108, 108¼, Commercial 4 p.ct. 86½, Continental Union 32½, 33, Gas Light and Coke 87, 87½, 4 p.ct. preference 76, 77¼, 3 p.ct. debenture 58¾, 59¼, 5 p.ct. debenture 100⅞, Imperial Continental 138, 138½, Liverpool 7 p.ct. preference 102, Primitiva 14s. 6d., 14s. 9d., 14s. 10½d., 15s., 15s. 1½d., South Metropolitan 100½, 100⅞, 3 p.ct. debenture 59¼, Tottenham "B" 90½, 90⅝. Supplementary prices, Eastbourne 3½ p.ct. "B" 102, Tottenham 6 p.ct. mortgages 97½.

On Wednesday, Alliance and Dublin 84⅜, 85⅛, Bombay 21s. 9d., British 107½, 108½, Gas Light and Coke 87, 87½, 3½ p.ct. 60⅜, 3 p.ct. debenture 59½, Imperial Continental 137, 138, 139, Oriental 100, Primitiva 14s. 6d., 14s. 7½d., 14s. 10½d., 14s. 11½d., 15s., South Metropolitan 100½, 101, 101½, South Suburban 5 p.ct. 103, 104. Supplementary prices, Gas Light and Coke Brentford 7½ p.ct mortgage 101, Liverpool 5 p.ct. 84⅜, Reading 5 p.ct. maximum 86, 86½.

On Thursday, Aldershot "C" 73, Alliance and Dublin 85⅛, 85¼, 85⅛, Commercial 4 p.ct. 87, European 6½, 6¾, 6⅞, 6¾, Gas Light and Coke 87, 87¼, 87⅞, 87½, 4 p.ct. preference 76½, 76⅝, 3 p.ct. debenture 58¾, 59⅜, Imperial Continental 137½, Primitiva 14s. 6d., 14s. 7½d.. 14s. 9d., South Metropolitan 100⅜, 101, 101½, South Suburban 103¼. Supplementary prices, Gas Light and Coke Brentford 7½ p.ct mortgage 101, Liverpool 5 p.ct. 84⅜, Reading 5 p.ct. maximum 86, 86½.

On Friday, Bournemouth 12½, 7 p.ct. 12½, British 107, 107¾, Commercial 4 p.ct. 88, 3½ p.ct. 86, 87½, 3 p.ct. debenture 56, European £6 10s. 6d., 6¾, Gas Light and Coke 86¾, 87, 87½, 3½ p.ct. 60⅝, 4 p.ct. preference 76, 3 p.ct. debenture 58¾, Imperial Continental 137½, 138, Primitiva 14s. 3d., 14s. 4½d., 14s. 6d., 14s. 6¾d., 14s. 7½d., South Metropolitan 100¾, 101, 101¼, 101½, South Suburban 5 p.ct. 103½. Supplementary prices, Eastbourne 3½ p.ct. "B" 103½, Liverpool 5 p.ct. 84½, Swindon 5 p.ct. 79½, Yorktown and Blackwater new 5 p.ct. preference 88½.

The sale of gold and the disturbance to the market caused thereby was reflected in the Treasury Bill tenders, and the Government had to pay just over 5s. p.ct. more on Treasury Bill allotments, the average rate being £3 17s. 0·95d. p.ct. Discount rates were also affected; and whereas 3⅛ p.ct. was difficult to obtain early in the week, business was seldom possible towards the close below 3⅞ p.ct. Lenders charged 3½ p.ct. for renewals, and new money was obtainable from 3½ p.ct. down to 3 p.ct.

On the Exchange Market the dollar-sterling fell on special buying, but firmed up towards the close to 4.85⅞. Italian lire weakened slightly, the Milan rate rising to 88⅞. French francs and other European currencies showed no material change.

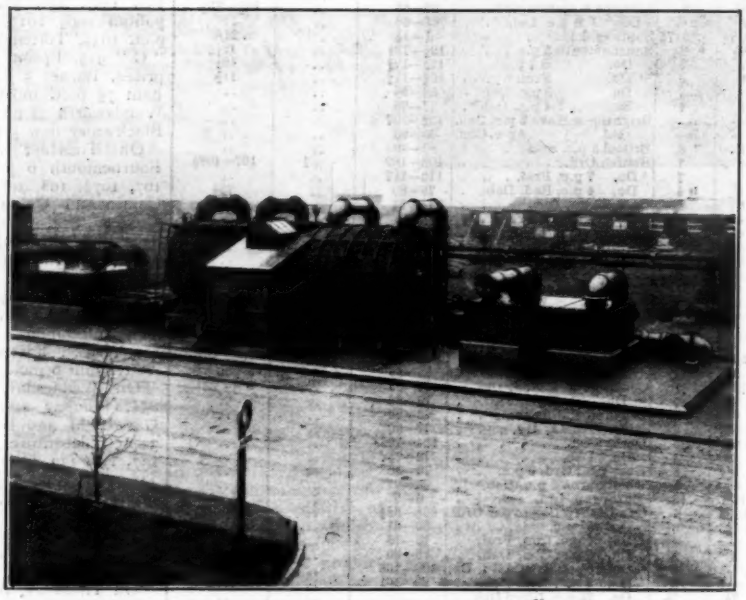
Further buying on Chinese account caused Silver to rise to 26⅞d. per oz.

The Bank Rate is 4½ p.ct., to which it was reduced from 5 p.ct. on April 21. Bankers' deposit rates are 2½ p.ct. The deposit rates of the discount houses are 2½ p.ct. at call and 2⅝ p.ct. at notice.

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf.Yr	Dividends. Last Hf. Yr.	NAME.	Quotations. May 20.	Rise or Fall on Week.	Transactions. Lowest and Highest Prices.
£			%p.a.	% p.a.				
171,978	Stk.	Feb. 10	5	5	Aldershot 5 p.c. max. C.	70—73	..	73
323,992	,,	,,	4	4	Do. 4 p.c. Pref.	66—71	..	..
1,651,888	,,	Apl. 7	6½	7	Alliance & Dublin Ord.	83—86	..	84½—85½
274,000	,,	Jan. 13	4	4	Do. 4 p.c. Deb.	65—68	..	..
300,000	1	Apl. 28	1/7½	1/7½	Bombay, Ltd.	1—1½	..	21/9
170,000	10	Mar. 10	8½	8½	Bournemouth 5 p.c.	12½—13½	..	12½
600,050	10	,,	7	7	Do. B 7 p.c.	11½—12½	..	12½
276,000	10	,,	6	6	Do. Pref. 6 p.c.	10½—11½	..	11½
80,000	Stk.	Jan. 13	3	3	Do. 3 p.c. Deb.	53—56	..	..
169,025	,,	,,	4	4	Do. 4 p.c. Deb.	75—78	..	..
267,900	,,	—	—	—	Brighton & Hove 6 p.c. Con.	102—107	..	..
341,800	,,	—	—	—	Do. 5 p.c. Con.	90—95	..	..
1,397,800	,,	Feb. 24	5	5	Bristol 5 p.c. max.	89—90a	..	..
885,000	,,	Mar. 24	8	7	British Ord.	106—109	+1	107—108½
100,000	,,	Dec. 30	7	7	Do. 7 p.c. Pref.	112—117	..	..
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb.	75—80	..	75½
100,000	10	Dec. 9	8	6	Cape Town, Ltd.	7½—8½	..	..
100,000	10	Apl. 28	4½	4½	Do. 4½ p.c. Pref.	6—7	..	..
150,000	Stk.	Dec. 30	4½	4½	Do. 4½ p.c. Deb.	88—93	..	..
685,880	,,	Feb. 24	6	6	Cardiff Con. Ord.	99—103	..	..
227,840	,,	Dec. 30	7½	7½	Do. 7½ p.c. Red. Deb.	100—103	..	..
197,150	,,	Feb. 24	5	6½	Chester 5 p.c. Ord.	86½—91½b	..	..
79,185	1	Apl. 28	†2/-	†2/-	Colombo Ltd. Ord.	26/—28/-	..	..
24,495	1	,,	1/4½	1/4½	Do. 7 p.c. Pref.	20/—22/-	..	..
821,490	1	Apl. 7	1/9½	1/9½	Colonial Gas Assn. Ld. Ord.	24/6—26/6	..	..
178,900	1	,,	1/7½	1/7½	Do. 6 p.c. Pref.	20/—22/-	..	..
1,518,280	Stk.	Feb. 24	5½	5½	Commercial 4 p.c. Cap.	86—89	..	88½—88
680,000	,,	,,	5/8/4	5/8/4	Do. 3½ p.c. Cap.	85—88	..	86—87½
475,000	,,	Dec. 30	8	8	Do 3 p.c. Deb.	56—59	+2	56
808,000	,,	Sept. 30	‡2	‡1	Continental Union, Ltd.	30—35	..	32½—33
200,000	,,	Mar. 10	7	7	Do. 7 p.c. Pref.	79—82	..	..
787,580	,,	Mar. 10	6½	6½	Croydon sliding scale	96—99	..	..
405,120	,,	,,	5	5	Do. max. div.	77—80	..	..
421,270	,,	Feb. 24	6	9	Derby Con.	104—106a	..	..
55,000	,,	Dec. 30	4	4	Do. Deb.	78—75a	..	..
200,000	,,	Mar. 10	5	5	East Hull Ord. 5 p.c.	76—80	..	..
80,000	,,	Dec. 30	5	5	Eastbourne 5 p.c. Deb.	92—97	..	..
1,008,180	10	Mar. 24	†3	†3	European, Ltd.	6—7	..	6½—6⅞
18,747,456	Stk.	Feb. 10	5/1/4	5	Gas Light & Coke 4 p.c. Ord.	86½—88½	..	88½—87½
1,990,000	,,	,,	3½	3½	Do. 3½ p.c. max.	59—61	..	59½—60⅜
4,187,020	,,	,,	4	4	Do. 4 p.c. Con. Pref.	76—78	..	78—77½
5,402,699	,,	Dec. 30	3	3	Do. 3 p.c. Con. Deb.	58—60	..	59½—59⅝
161,815	,,	,,	—	6	Do. 6 p.c. Br'tf'd Rd. Db.	100—105	..	..
1,442,770	,,	,,	—	5	Do. 5 p.c. Red. Deb.	99—101	..	100⅝
43,090	,,	,,	7½	7½	Do. 7½ p.c. Ilford Deb.	..	..	..
82,800	,,	Mar. 10	6½	6½	Hastings & St L. 5 p.c. Conv	90—92	..	..
328,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	67—72	..	..
70,000	10	Apl. 28	†10	†10	Hongkong & China, Ltd.	12—13	..	..
178,800	Stk.	Mar. 10	5	5	Hornsey Con. 3½ p.c.	67—69	..	..
1,916,000	,,	May 12	10	10	Imperial Continental Gas.	137—141*	..	137—139
263,130	,,	Feb. 10	3½	3½	Do. 3½ p.c. Red. Deb.	69—71	..	..
235,249	,,	Mar. 10	6½	6½	Lea Bridge 5 p.c. Ord.	92—97	..	..
3,145,907	,,	Feb. 24	5½	5½	Liverpool 5 p.c. Ord.	84—85b	−½	84½—85
400,000	,,	Sept. 30	7	7	Do. 7 p.c. Red. Pref.	102—104b	..	..
165,736	,,	Feb. 24	9	8	Maidstone 5 p.c. Cap.	110—115	..	..
69,480	,,	Dec. 30	3	3	Do. 3 p.c. Deb.	52—57	..	..
75,000	5	Dec. 9	†7	†7	Malta & Mediterranean	5½—6½	..	..
541,920	Stk.	Nov. 25	†6	†5	Montevideo, Ltd.	85—90	..	..
2,061,815	,,	Feb. 24	5	5	Newcastle & Gateshead Con.	75—76d	+½	..
380,929	,,	,,	4	4	Do. 4 p.c. Pref.	68—69d	−½	..
691,705	,,	Dec. 30	3½	3½	Do. 3½ p.c. Deb.	68—69d	..	..
181,785	,,	—	—	—	North Middlesex 6 p.c. Con.	91—93	..	..
300,000	,,	Apl. 28	9	7	Oriental, Ltd.	97—102	..	99—100
188,120	,,	Dec. 30	7½	7½	Plym'th & Ston'house 5 p.c.	105—110	..	..
414,600	,,	Feb. 24	7½	7½	Portsm'th Con. Stk. 4 p.c. Std.	100—105	..	..
266,782	,,	,,	5	5	Do. 5 p.c. max.	76—79	..	..
2,289,909	1	—	—	—	Primitiva Ord.	14/—15/-	−1/-	14/3—15/6
282,200	100	Dec. 1	4	4	Do. 4 p.c. Red. Deb.	85—87	..	..
600,000	Stk.	Jan. 27	4	4	Do. 4 p.c. Red. Deb. 1911	70—72	..	..
484,262	,,	Dec. 30	—	4	Do. 4 p.c. Cons. Deb.	70—72	..	..
150,000	10	Mar. 24	6	6	San Paulo 6 p.c. Pref.	71—73	..	..
135,000	50	July 1	5	5	Do. 5 p.c. Red. Deb.	47—50	..	..
270,000	Stk.	Mar. 24	5½	5½	Sheffield A	100—102c	+5	..
419,268	,,	,,	5½	5½	Do. B	100—102a	+5	..
1,047,000	,,	,,	5½	5½	Do. C	100—102a	+5	..
90,000	10	June 11	4	—	South African	4—6	..	..
6,809,895	Stk.	Feb. 24	5	7	South Met. Ord.	100—102	..	100½—101½
1,895,445	,,	Jan. 13	3	3	Do. 3 p.c. Deb.	57—60	..	59½
734,000	,,	Mar. 10	6½	6½	Do. 6½ p.c. Red. Db.	99—101	..	..
91,600	,,	Feb. 24	8½	8½	South Shields Con.	104—106d	..	..
1,942,795	,,	Mar. 10	6½	6½	South Suburban Ord. 5 p.c.	103—106	+1	103—104
388,837	,,	Dec. 30	5	5	Do. 5 p.c. Deb.	93—96	..	..
647,740	,,	Mar. 24	5	5	South'mpton Ord. 5 p.c. max.	74—77	..	..
121,275	,,	Dec. 30	4	4	Do. 4 p.c. Deb.	68—73	..	..
250,000	,,	Feb. 24	7	7	Swansea 7 p.c. Red. Pref.	100—102	..	..
200,000	,,	Dec. 30	6½	6½	Do. 6½ p.c. Red. Deb.	103—104	..	..
150,000	,,	Feb. 24	7½	7½	Tottenham District A 5 p.c.	108—110	..	..
869,275	,,	,,	6½	6½	Do. B 5½ p.c.	89—92	..	90½—91
150,000	,,	,,	5½	5½	Do. 5½ p.c. Pref.	97—100	..	..
181,265	,,	Dec. 9	4	4	Do. 4 p.c. Deb.	72—75	..	..
358,251	,,	Mar. 10	5	5	Tynemouth Con. and New	71—72d	+1½	..
197,294	,,	Mar. 10	6½	6½	Uxbridge, Maidenhead, & Wycombe 5 p.c.	85—90	..	..
88,880	,,	,,	5	5	Do. 5 p.c. pref.	83—88	..	..
91,800	,,	,,	6½	6½	Do. 5 p.c. Maidenh'd	83—88	..	..
30,000	,,	Mar. 10	8½	8½	Wandsworth, Wimbledon, and Epsom— Wandsworth A 5 p.c.	120—125	..	..
255,686	,,	,,	7	7	Do. B 5½ p.c.	102—107	..	..
482,585	,,	,,	5/19/0	5/19/0	Do. C and New	90—95	..	91½
862,000	,,	,,	6⅞	6⅞	Wimbledon 5 p.c.	98—103	..	105
90,000	,,	,,	7½	7½	Epsom 5 p.c.	103—108	..	..
86,416	,,	Dec. 30	3	3	3 p.c. Deb.	54—57	..	..

Quotations at:—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. * Ex. div. † Paid free of income-tax ‡ For year.

"HOLMES' Super Type Installations for 1927"



A recent **HOLMES'** Installation at the new Pitwines Works of the Bournemouth Gas and Water Company.

The above Plant, working in conjunction with an installation of **HOLMES' "SUPER" TYPE CONDENSERS,** recovers the whole of the tar and ammonia contained in the gas without washing with water.

The ROTARY WASHER (1920 PATENT BRUSH WASHER) is used for concentration of weak liquor, the ammonia remaining in the gas being absorbed by sulphuric acid in a final **HOLMES' CONTACT CHAMBER.**

A HOLMES' PATENT "DRI-GAS" PLANT will also shortly be in operation, enabling all gas produced on the works to be freed from moisture and naphthalene before distribution.

W. C. HOLMES & Co., Ltd.

GAS - AND - BYE-PRODUCTS - ENGINEERS

TELEPHONES
H FIELD 1573
PVTE. BRANCH EX.

Whitestone Ironworks,
HUDDERSFIELD

TELEGRAMS
"HOLMES
HUDDERSFIELD"